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MEMORANDUM

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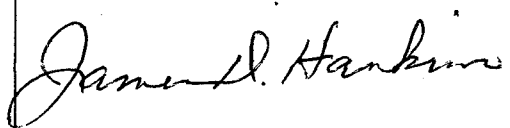
FLAT CONDUCTOR CABLE CONNECTOR
SURVEY OF 1970

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Product Engineering and Process Technology Laboratory

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NASA

*George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama*

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16. ABSTRACT <p>This document contains data and illustrations concerned with commercial and Government flat conductor cable (FCC) connecting and terminating hardware which is currently available or is in development. Material was obtained from a NASA-sponsored, industry-wide survey conducted from August 1970 to December 1970 and has been separated into two major sections. One consists of component data sheets with information compiled from questionnaires. The other contains additional manufacturer-supplied information, such as photos, illustrations, and component family data sheets.</p> <p style="text-align: center;">EDITOR'S NOTE</p> <p>Use of trade names or names of manufacturers in this report does not constitute an official endorsement of such products or manufacturers, either express or implied, by the National Aeronautics and Space Administration or any other agency of the United States Government.</p> <p>No aspect of this report (with the exception of manufacturer-supplied data in Section IV) may be reprinted without the expressed written permission of NASA. Permission to reprint any manufacturer-supplied material in Section IV must be obtained from the individual companies.</p>			
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PREFACE

This document was prepared from information obtained during a survey conducted by Candace Swanson and Glenn Walker of Hayes International Corporation. The work was performed to fulfill the requirements of a Technical Directive issued by the Manufacturing Research and Technology Division, Product Engineering and Process Technology Laboratory, George C. Marshall Space Flight Center, Huntsville, Alabama.

Special thanks go to the contributing manufacturers listed on pages vii and viii. As additional material becomes available, revisions will be made to this document. Any company desiring to have applicable data included should contact

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GLOSSARY

Company Abbreviations

AMP — AMP Incorporated
Ansley — Ansley, Division of Thomas & Betts Corporation
Belling and Lee — Belling and Lee of Enfield, England, represented in the United States by the Ercona Corporation
Berg — Berg Electronics
Burndy — Burndy Corporation, Tape Cable Division
ITT Cannon — ITT Cannon Electric Inc., Phoenix Division
Kings — Kings Electronics Company Incorporated
Malco — Malco Manufacturing Company Inc.
Methode — Methode Electronics, Incorporated
Microdot — Microdot Incorporated, Connector Division
NASA — NASA, George C. Marshall Space Flight Center
Thomas & Betts — Thomas & Betts Corporation

Connector — Mated separable plug and receptacle, designed to connect a cable with another cable, printed circuit board, box or component.

Flat Conductor Cable (FCC) — Cable consisting of flat parallel conductors laminated between thin flexible plastic insulating films, or otherwise held in a regular flat configuration.

Flexible Circuit — Circuit consisting of etched conductors laminated between insulating material. The circuit is usually asymmetrical and designed for a specific application.

Housing — Outermost part of a plug, receptacle, or transition. Frequently referred to as the shell.

Overall Mated Dimensions — Total depth (D), width (W), and height (H) or diameter (Dia) and Length (L) of a mated connector; including mounting, latching, and safety devices.

Overall Unmated Dimensions — Total depth (D), width (W), and height (H) or diameter (Dia) and length (L) of a plug, a receptacle, or transition parts. Dimensions include those of mounting, latching, and safety devices.

Plug — Part of a connector. Usually it is the inserted (movable) half of the connector.

Receptacle — Part of a connector. Usually it is the stationary half of the connector (fixed to an equipment box or an electrical component) and has mounting provisions.

Resistance for Mated Connector — Overall resistance of the mated wired connector, as defined by MIL-C-55544 paragraph 4.5.13.

Ribbon Cable — Cable in a flat configuration and containing round wires.

T × W — Thickness and Width. Dimensions of a flat conductor.

Transition — Fixed connection of FCC to round wire, printed circuit board, box, or electrical component. Connection is permanent or disassembled only with difficulty.

CONTRIBUTING MANUFACTURERS

AMP Inc.
P. O. Box 3608
Harrisburg, Pa. 17105

Ansley Corporation
Old Easton Road
Doylestown, Pa. 18901

Belling and Lee (Enfield, England)
Represented in the U. S. By:

Ercona Corporation
2121 Bellmore Avenue
Bellmore, N. Y. 11710

Berg Electronics
New Cumberland
Pa. 17070

Burndy Corporation
Tape Cable Division
Norwalk, Conn. 06852

Kings Electronics Co. Inc.
40 Marbledale Rd.
Tuckahoe, N. Y. 10707

ITT Cannon Electric Inc.
Phoenix Division
2801 Airlane
Phoenix, Ariz. 85034

Malco Manufacturing Company Inc.
5150 West Roosevelt Road
Chicago, Ill. 60650

Methode Electronics, Inc.
7447 W. Wilson Ave.
Chicago, Ill. 60656

Microdot Inc.
Connector Division
220 Pasadena Ave.
South Pasadena, Calif. 91030

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SECTION I. INTRODUCTION



SECTION I. INTRODUCTION

Background

Although the benefits of using flat conductor cable (FCC) systems have been demonstrated repeatedly, application has been limited, partially because of a lack of awareness of available connecting and terminating devices. By using the proper interconnecting hardware, the economy of FCC systems can be improved greatly.

During the period of August 1970 to December 1970, a NASA-sponsored survey was conducted with the specific intent of locating current and potential sources of FCC connecting and terminating devices within Government and industry, obtaining data on available items and those in development and compiling the material into a design handbook.

Handbook Description

This design handbook is concerned solely with FCC connecting and terminating hardware. Although various special connecting and terminating techniques have been developed by industry, these are not within the scope of the document unless hardware for performing the technique is being marketed or is ready for marketing.¹

The handbook is intended to be of use to managers, engineers, designers, procurement specialists, and other interested personnel. The format is designed so that coverage by item and producer will be comprehensive enough to enable an individual to select items which will meet his requirements. Then, more detailed information (including prices) can be obtained directly from the manufacturer.

With the exception of minor editing, all data have been included as received. No attempt has been made to validate material accuracy or to endorse any one manufacturer of FCC hardware. No attempt has been made to judge the quality or suitability of any item manufactured by any company for

1. Companies which have developed techniques for connecting FCC include McDonnell Douglas Corporation of Huntington Beach, California, and Components Corporation of Denville, New Jersey.

and particular use. These aspects are left to the discretion of the user. Information is valid only as of this report's date of publication. Prior to making final component selection, the purchaser should contact the manufacturer for information concerning any part modifications and to assure that all data are as indicated.

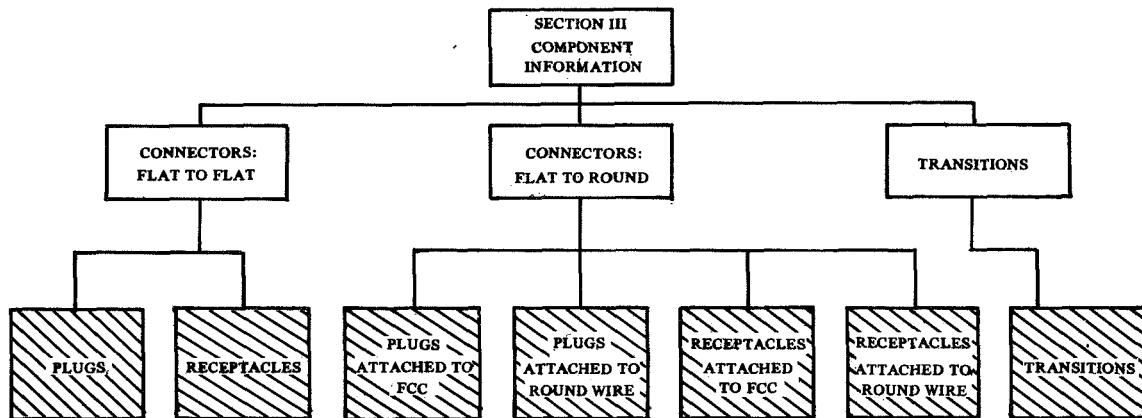
Data have been grouped in three sections: Section II, Component Availability and Location; Section III, Component Information; and Section IV, Manufacturers' Data.

Section II. Component Availability and Location consists of two types of charts: (1) Component Availability by Contact Number and Manufacturer and (2) Index to Parts and Manufacturers. The former enables the reader to immediately determine which companies manufacture, or are developing, parts containing the required number of contacts and cable layers. At this stage, the reader can directly contact the producer for information or can turn to the second type chart, Index to Parts and Manufacturers, which provides page numbers within the handbook where data can be obtained, either by company or component.

Section III. Component Information consists of standardized data sheets containing material compiled from questionnaires. This section has been subdivided into three major areas according to type connector or transition:

1. Connectors: Flat to Flat
(Separable plugs and receptacles for FCC to FCC, FCC to flexible circuit, or FCC to printed circuit board connections).
2. Connectors: Flat to Round
(Separable plugs and receptacles for FCC to round wire connections).
3. Transitions
(Fixed and semipermanent connections of FCC to round wire, printed circuit boards, components, etc.).

Modifications of connector or transition components which allow the part to be used for termination purposes are described under the connector or transition headings. One or more completed sets of data sheets (charts) have been prepared for each of the shaded component blocks in the following graphic breakdown of Section III. Within each chart, components are listed by company.



Section IV. Manufacturers' Data contains additional producer-supplied material (component family data sheets, photos, drawings). Material is arranged alphabetically by manufacturer.

By systematic use of the three data sections, the reader can

1. Determine availability of potentially useful components and names of producers
(Section II. Component Availability and Location)
2. Locate page numbers for applicable information within the handbook
(Section II. Component Availability and Location)
3. Compare and select potentially useful items
(Section III. Component Information)
4. Obtain additional manufacturer-supplied information for items of interest
(Section IV. Manufacturers' Data)

EXAMPLE DEMONSTRATING HANDBOOK USE

A designer needs a connector to join FCC to FCC. Additional requirements are that the connector meet the following conditions:

20	Contacts
2	Cable layers
600 V (rms)	Voltage rating
5 A	Current rating

Turn directly to . . .

1. Section II. Component Availability and Location

This section consists of two types of charts. The first, "Component Availability by Contact Number and Manufacturer" (Charts II-1 to II-3), enables the designer to quickly see if potentially useful connectors are available. Since the designer is interested in connectors for flat to flat applications, locate "Component Availability by Contact Number and Manufacturer: Connectors for Flat To Flat Connections." According to this chart, only two companies (AMP and Methode) have connectors with the required number of contacts (20) and cable layers (2).

Using Chart II-4, "Index to Parts and Manufacturers," the designer can locate page numbers for information on potentially useful items. Assume that only chart data is pertinent at this stage. Looking down the first column, "Manufacturers," locate AMP and Methode. Then read across to "Connectors: Flat to Flat." Chart data on AMP plugs and receptacles begins on pages III-1 and III-37. Chart information on Methode plugs and receptacles begins on pages III-21 and III-61. Turn to . . .

2. Section III. Component Information

One notes that the section breakdown is on the page following the section divider. Also, section parts are tabbed for added convenience.

For AMP plug information, turn to page III-1. Locate column headings of primary interest (contact number, number of cable layers, voltage rating, and current rating). No plugs in this chart meet the voltage rating requirement of 600 V (rms) and the current rating of 5 A. Turn to the next two charts for more AMP plug data. Again, the voltage and current rating requirements cannot be met. Charts with information on AMP receptacles (beginning on page III-37) indicate this same fact, none of the AMP components meet all the designer's requirements.

Methode remains as a producer of potentially useful items. Turn to page III-21 (obtained from Chart II-4, "Index to Parts and Manufacturers") for plug information. The first chart with Methode data does not describe components meeting all requirements. Only on the second chart can one find a plug (63-6220-1100) with 20 contacts, 2 cable layers, 600 V (rms) voltage rating, and a current rating of 5A which is suitable for FCC to FCC applications. For information on the mating receptacle, turn to page III-61 (again obtained from Chart II-4), beginning of Methode receptacle data.

If the reader is interested in additional manufacturer supplied data, he can locate the beginning page number in the third Section III chart column, "Manufacturer's Data," and then turn to . . .

3. Section IV. Manufacturers' Data



**SECTION II. COMPONENT AVAILABILITY
AND LOCATION**



CHART II-1. COMPONENT AVAILABILITY BY CONTACT NUMBER AND MANUFACTURER:
CONNECTORS FOR FLAT TO FLAT CONNECTIONS

Contact Number	Number of FCC Layers by Manufacturer							Malco	Methode	Microdot	NASA
	AMP	Ansley	Belling and Lee	Berg	ITT Cannon	Kings					
4			(Note 1) CONTACT NUMBER: 50 MAX, 1 LAYER	(Note 1)	(Note 2)	(Note 3)	CONTACT MALCO FOR INFORMATION				
6					1						2
7		1				1					
8						2					
9	1	1			1	1*			2		
10											
12		1			1	1*, 2, or 3					2
14		1				1 or 2					
15		1							2		
16		1									
17					1	1*	1				
18	2					1, 2*, or 3					
19	1				1	1					
20	2	1									
21						3			2		
22		1					1				2
24		1				1* or 2*					
25					1	1					
27						1 or 3*	1				
28		1				2					
29	1	1		1	1						
30		1									
31											
32					1*	1		2			
33	1										
34					2*	2					
36		1			2 or 3*					2	
37		1		1	1						
38	2			1	1 or 2				2		
40	2	1									

Note 1: All Belling and Lee and Berg connectors are developmental. One of the 20-contact Methode plugs (designed for back panel systems) is developmental.

Note 2: * Connectors include those which are tooled. All other ITT Cannon connectors are developmental.

Note 3: All 2-layer Kings items are printed circuit receptacles only.

CHART II-1. (Concluded)

Contact Number	Number of FCC Layers by Manufacturer				Methode	Microdot	NASA
	AMP	Ansley	Belling and Lee	Berg			
42			(Note 1)	(Note 1)			
44		1			2		
45		1					
47				1*			
48		1		2*	2		2
50		1		2			
51				3*		3	
54				2 or 3			
56		1					
57				1 or 3			
58	2			2			
60		1					
64				2*			2
66	2						
67		1					
70	2						
72		1		3*			
74				2			
75				3			
76				2			2
81				3			
87				3			
91		1					
94				2*			
96				3*			
100		1					
111				3			
114				2 or 3			
141				3*			
171				3			

CONTACT MALCO FOR INFORMATION

CONTACT NUMBER: 50 MAX, 1 LAYER

Note 1: All Belling and Lee and Berg connectors are developmental.

Note 2: * Connectors include those which are tooled. All other ITT Cannon connectors are developmental.

Note 3: All 2-layer Kings items are printed circuit receptacles only.

CHART II-2. COMPONENT AVAILABILITY BY CONTACT NUMBER AND MANUFACTURER:
CONNECTORS FOR FLAT TO ROUND CONNECTIONS

Contact Number	Number of FCC Layers by Manufacturer						
	AMP	Ansley	Belling and Lee	Berg	ITT Cannon	Kings	Malco
4			(Note 1)	(Note 1)	(Note 2)		
6					1		
7					1		
8					2		
9	1			1	1*		2
12				1	1*, 2, or 3		2
14					1 or 2		
15		1					2
17				1	1*	1	
18	2				1, 2*, or 3		
19	1			1	1		
20	2						
21					3		2
22		1				1	
24					1* or 2*		
25				1	1		2
27					1 or 3*	1	
28		1			2		
29	1			1	1		
30		1					
31							2
32					1*	1	
33	1						
34					2*		
36		1			2 or 3*		2
37				1			2
38	2			1	1 or 2		
40	2						
42					3		
47					1*		

CONTACT MALCO FOR INFORMATION

CONTACT NUMBER: 50 MAX, 1 LAYER

Note 1: All Belling and Lee and Berg connectors are developmental.

Note 2: * Connectors include those which are tooled. All other ITT Cannon connectors are developmental.

Note 1: All Belling and Lee and Berg connectors are developmental.
Note 2: * Connectors include those which are tooled. All other ITT Cannon connectors are developmental.

CHART II-3. COMPONENT AVAILABILITY BY CONTACT NUMBER AND MANUFACTURER:
TRANSITIONS

Type transitions: All transitions are used in joining FCC and round wire with the exception of AMP hardware. These are used solely for FCC to printed circuit board use. Burndy transitions are used for FCC to round wire or printed circuit boards, and also to terminate FCC.

Contact Number	Number of FCC Layers by Manufacturer					
	AMP	Berg	Burndy	Kings	NASA	Thomas & Betts
9	(Note 1)* 1	(Note 2)* 1	(Note 2)*			(Note 3)*
12		1				
17		1	1			
18	2					
19	1	1				
20	2					
24					2	
25		1				
27			1			
29	1	1				
33	1					
34				2		
36					2	
37		1	1			

* See page II-6 for Notes 1, 2, and 3.

CHART II-3. (Concluded)

Contact Number	Number of FCC Layers by Manufacturer					
	AMP *	Berg *	Burndy *	Kings	NASA	Thomas & Betts *
38	2	1				
40	2					
44				2		
50					2	
54				2		
57		1				
58	2					
64				2	2	
66	2					
70	2					
76					2	

* See page II-5 for references to Notes 1, 2, and 3.

Note 1: These AMP items are plugs and receptacles with solder tabs.

Note 2: All Berg and Burndy transitions are developmental.

Note 3: Available from Thomas & Betts: Copper lug for connecting a single flat conductor with round stranded wire.

CHART II-4. INDEX TO PARTS AND MANUFACTURERS

	Components: Chart Information (Initial Page Numbers Given)								Components: Manufacturer's Data (Initial Page Numbers Given)
	Connectors: Flat To Flat			Connectors: Flat To Round				Transitions	
	Plugs	Receptacles	Plugs Attached To FCC	Plugs Attached To Round Wire	Receptacles Attached To FCC	Receptacles Attached To Round Wire			
Manufacturers									
AMP	III-1	III-37	III-81	III-93	III-105	III-113	III-129	IV-1	
Ansley	III-9	III-45	III-81	---	---	III-113	---	IV-27	
Belling and Lee	III-9	III-45	III-81	---	III-105	---	---	---	
Berg	III-13	III-49	III-81	III-93	III-105	III-113	III-129	---	
Burndy	---	---	---	---	---	---	III-129	IV-49	
ITT Cannon	III-13	III-49	III-85	III-93	III-105	III-113	---	IV-53	
Kings	III-21	III-57	III-85	III-101	III-109	III-121	III-133	IV-67	
Malco	---	---	---	---	---	---	---	IV-73	
Methode	III-21	III-61	---	---	---	---	---	---	
Microdot	III-25	III-69	III-85	III-101	III-109	III-121	---	IV-79	
NASA	III-29	III-73	III-85	---	---	III-121	III-133	IV-97	
Thomas & Betts	---	---	---	---	---	---	III-137	IV-119	



SECTION III. COMPONENT INFORMATION



7

8



SECTION III. COMPONENT INFORMATION

CONNECTORS: FLAT TO FLAT

Plugs [REDACTED]

Receptacles [REDACTED]

CONNECTORS: FLAT TO ROUND

Plugs Attached To FCC [REDACTED]

Plugs Attached To Round Wire [REDACTED]

Receptacles Attached To FCC [REDACTED]

Receptacles Attached To Round Wire [REDACTED]

TRANSITIONS [REDACTED]



CHART III - 1. CONNECTORS: FLAT TO FLAT, PLUGS

IDENTIFICATION				ELECTRICAL DATA					PHYSICAL DATA: GENERAL (Physical Data Continued)				
Manufacturer And Part	Mating Part	Manufac- turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
AMP	Note 1	Note 1											Note 4
	Receptacle With Mounting Ears: 86563, Without: 86572	IV-1											
1	86562-3	86563-1	300	3	5000	25	0.25x1.66x1.21	9	0.100	1.0	0.003x0.060-0.065	1	2.2
2	86562-4	86572-1					0.25x1.66x1.21			2.0			3.8
3	86562-2	86563-2					0.25x2.66x1.21	19					
		86572-2					0.25x2.66x1.21			3.0			5.7
		86563-3					0.25x3.66x1.21	29					
4	86562-1	86572-3					0.25x3.66x1.21			3.4			6.3
		86563-4					0.25x4.06x1.21	33					
		86572-4					0.25x4.06x1.21						
	Receptacle With Mounting Ears: 86563, Without: 86572												
5	86555-2	86563-1					0.25x1.66x1.21	0		1.0			2.2
6	86555-1	86572-1					0.25x1.15x1.21			2.0			3.8
		86563-2					0.25x2.66x1.21	19					
		86572-2					0.25x2.15x1.21			3.0			5.7
7	86555-3	86563-3					0.25x3.66x1.21	29					
		86572-3					0.25x3.15x1.21			3.4			6.3
8	86555-4	86563-4					0.25x4.06x1.21	33					
		86572-4					0.25x3.55x1.21						
	Receptacle With Mounting Ears: 86672, Without: 86673												
9	1-86670-1	1-86672-1					0.30x1.66x1.21	18		1.0		2	2.2
10	86670-5	1-86673-1					0.30x1.66x1.21			1.1			2.4
		86672-5					0.30x1.76x1.21	20					
		86673-5					0.30x1.76x1.21			2.0			4.6
11	86670-3	86672-3					0.30x2.66x1.21	38					
		86673-3					0.30x2.66x1.21			2.1			4.8
12	86670-7	86672-7					0.30x2.76x1.21	40					
		86673-7					0.30x2.76x1.21		0.100	3.0	0.003x0.060-0.065	2	7.0
13	1-86670-3	1-86672-3					0.30x3.66x1.21	58					
		1-86673-3					0.30x3.66x1.21						
(Continued)													

Note 1: FCC plugs and receptacles with and without mounting ears are part of the AMP-UNYT connector series. Refer to the last column, "Remarks," for additional information on mating possibilities.
 Note 2: Mated dimensions exclude locking mounting screws and spring clips.
 Note 3: Round wire 24-22 AWG may be used.
 Note 4: Weights are approximate.

CHART III - 1. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
AMP	Note 1	Note 1	Note 1	Note 1	Note 2	Note 2	Note 2	Note 2	Note 2
<u>Plug With Mounting Ears</u>									
1 86562-3	Crimp	Removable	Pin	Phosphor Bronze	For All Series: Gold (Available: 15, 30, or 50) Over 30 Nickel	1300	200	500	No Data
2 86562-4						2700	400		
3 86562-2						4100	600		
4 86562-1						4700	700		
<u>Plug Without Mounting Ears</u>									
5 86555-2						1300	200		
6 86555-1						2700	400		
7 86555-3						4100	600		
8 86555-4						4700	700		
<u>Plug With Mounting Ears</u>									
9 1-86670-1						2600	400		
10 86670-5						2800	400		
11 86670-3						5400	800		
12 86670-7						5700	900		
13 1-86670-3	Crimp	Removable	Pin	Phosphor Bronze		8200	1200	500	No Data
(Continued)									

Note 1: Solder tab contacts for permanent printed circuit board terminations are also available.

Note 2: Mating force measurements are maximum, unmating are minimum.

CHART III - 1. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part		PHYSICAL DATA: ASSEMBLY									
		Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP		Note 1									
Plug With Mounting Ears											
1	86562-3	0.25x1.68x0.93	Polysulfone Per MIL-P-46120	None	Terminated To Contact	Single Row	Available For Series: Spring Clip Or Jackscrews	Screw	None	None	Refer To Mating Part
2	86562-4	0.25x2.68x0.93									
3	86562-2	0.25x3.68x0.93									
4	86562-1	0.25x4.06x0.93									
Plug Without Mounting Ears											
5	86555-2	0.25x1.15x0.93									
6	86555-1	0.25x2.15x0.93									
7	86555-3	0.25x3.15x0.93									
8	86555-4	0.25x3.55x0.93	Polysulfone Per MIL-P-46120			Single Row	Spring Clip	None			
Plug With Mounting Ears											
9	1-86670-1	0.30x1.68x0.93	For Series: Self-extinguish- ing Glass- Filled Nylon			Double Row, In-line	Jackscrews	Screw			Refer To Mating Part
10	86670-5	0.30x1.76x0.93									
11	86670-3	0.30x2.66x0.93									
12	86670-7	0.30x2.76x0.93									
13	1-86670-3	0.30x3.66x0.93		None	Terminated To Contact	Double Row, In-line	Jackscrews	Screw	None	None	Refer To Mating Part
(Continued)											

Note 1: Dimensions exclude locking and mounting screws and spring clips.

CHART III - 1. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part		ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
		Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
AMP										
Note 1										
<u>Plug With Mounting Ears</u>										
1	86562-3	None	-55 To +140	For All Series: Flat Cable Hand Crimping Tool #90236-1, Flat Cable Auto. Crimping Machine #693790-2, Extraction Tools For Pins #91047	None Required	None Required	For All Series: Military Uses, Computers And Related Equipment, Consumer Products	Stock	IPC-FC-218	Type Flat To Flat Connections For All Series: FCC To FCC, Flexible Circuit, Printed Circuit Board, And Aluminum Panel. Plugs can also be used for flat to round and round to round connections. Round wire and FCC can be intermixed in any housing. Flexible circuits can be crimp terminated pro- vided the termination pads are made to AMP specifications. Plugs will mate with AMPMODU Mod. II pc board connec- tors. FCC contacts can be crimped anywhere on a cable to allow daisy chaining. FCC must conform to IPC-FC-220, Tol. Class IV. Insulation material must be polyester or polyimide.
2	86562-4									
3	86562-2									
4	86562-1									
<u>Plug Without Mounting Ears</u>										
5	86555-2									
6	86555-1									
7	86555-3									
8	86555-4									
<u>Plug With Mounting Ears</u>										
9	1-86670-1									
10	86670-5									
11	86670-3									
12	86670-7									
13	1-86670-3	None	-55 To +140		None Required	None Required		Stock	IPC-FC-218	
(Continued)										

Note 1: When round wires are used, the following tools are needed: Round Wire Hand Crimping Tool #90222-2, Auto. Crimping Machine for Contacts #687348-1, Extraction Tools for Contacts #91047.

CHART III - 2. CONNECTORS: FLAT TO FLAT, PLUGS

IDENTIFICATION			ELECTRICAL DATA					PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufac-turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
AMP (Con.)	Note 1	IV-1	Note 2					Note 3			Note 4		
Plug With Mounting Ears (Con.)	Receptacle With Mounting Ears: 86672, Without: 86673												
1 86670-9	86672-9		300	3	5000	25	0.30x4.06x1.21	66	0.100	3.4	0.003x0.060-0.065	2	7.9
2 86670-1	86673-9						0.30x4.06x1.21	70		3.6			8.1
	86672-1						0.30x4.26x1.21						
	86673-1						0.30x4.26x1.21						
Plug Without Mounting Ears	Receptacle With Mounting Ears: 86672, Without: 86673												
3 1-86671-1	1-86672-1						0.30x1.66x1.21	18		1.0			2.2
4 86671-5	1-86673-1						0.30x1.15x1.21	20		1.1			2.4
5 86671-3	86672-5						0.30x1.76x1.21	38		2.0			4.6
6 86671-7	86673-5						0.30x1.25x1.21	40		2.1			4.8
7 1-86671-3	86672-3						0.30x2.66x1.21	58		3.0			7.0
8 86671-9	86673-3						0.30x2.15x1.21	66		3.4			7.9
9 86671-1	86672-7						0.30x2.76x1.21	70		3.6			8.1
	86673-7						0.30x2.25x1.21						
	1-86672-3						0.30x3.66x1.21						
	1-86673-3						0.30x3.15x1.21						
	86672-9						0.30x4.06x1.21						
	86673-9						0.30x3.55x1.21						
	86672-1						0.30x4.26x1.21						
	86673-1						0.30x3.75x1.21						
Plug With Mounting Ears	Receptacle With Mounting Ears: 86578-3												
10 86577-3	86578-3		300	3	5000	25	0.29x2.66x1.21	38	0.100	2.0	0.003x0.060-0.065	2	6.8
(Continued)													

Note 1: FCC plugs and receptacles with and without ears are part of the AMP-UNYT connector series. Refer to the last column, "Remarks," for additional mating possibilities.
Note 2: Mated dimensions exclude locking and mounting screws and spring clips.

Note 3: Round wire 24-22 AWG may be used.
Note 4: Weights are approximate.

CHART III - 2. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
AMP (Con.)			Note 1			Note 2	Note 2		
<u>Plug With Mounting Ears (Con.)</u>									
1 86670-9	Crimp	Removable	Pin	Phosphor Bronze	For All Series: Gold (Available: 15, 30, Or 50) Over 30 Nickel	9400	1400	500	No Data
2 86670-1						9900	1500		
<u>Plug Without Mounting Ears</u>									
3 1-86671-1						2600	400		
4 86671-5						2800	400		
5 86671-3						5400	800		
6 86671-7						5700	900		
7 1-86671-3						8200	1200		
8 86671-9						9400	1400		
9 86671-1						9900	1500		
<u>Plug With Mounting Ears</u>									
10 86577-3	Crimp	Removable	Pin	Phosphor Bronze		5400	800	500	No Data
(Continued)									

Note 1: Solder tab contacts for permanent printed circuit board terminations are also available.

Note 2: Mating force measurements are maximum, unmating are minimum.

CHART III - 2. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP (Con.)	Note 1									
<u>Plug With Mounting Ears (Con.)</u>										
1 86670-9	0.30x4.06x0.93	For Both Series: Self- Extinguishing Glass-Filled Nylon	None	Terminated To Contact	Double Row, In-line	Jackscrews Jackscrews	Screw Screw	None	None	Refer To Mating Part
2 86670-1	0.30x4.26x0.93									
<u>Plug Without Mounting Ears</u>										
3 1-86671-1	0.30x1.15x0.93									
4 86671-5	0.30x1.25x0.93									
5 86671-3	0.30x2.15x0.93									
6 86671-7	0.30x2.25x0.93									
7 1-86671-3	0.30x3.15x0.93									
8 86671-9	0.30x3.55x0.93									
9 86671-1	0.30x3.75x0.93									
<u>Plug With Mounting Ears</u>										
10 86577-3	0.29x2.66x0.93	Diallyl- phthalate Per MIL-M-14-F- STG	None	Terminated To Contact	Double Row, In-line	Jackscrews	Screw	None	None	Refer To Mating Part
(Continued)										

Note 1: Dimensions exclude locking and mounting screws and spring clips.

CHART III - 2. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
AMP (Con.)			Note 1						
Plug With Mounting Ears (Con.)									
1 86670-9	None	-55 To +105	For All Series: FCC Hand Crimp- ing Tool #90236-1, FCC Auto. Crimp- ing Machine #693790-2, Extraction Tools For Pins #91047	None Required	None Required	For All Series: Military Uses, Computers And Related Equipment, Consumer Products	Stock	IPC-FC-218	Type Flat To Flat Connections For All Series: FCC To FCC, Flexible Circuit, Printed Circuit Board And Aluminum Panel. Plugs can also be used for flat to round and round to round connec- tions. Round wire and FCC can be intermixed in any housing. Flexible circuits can be crimp terminated provided the termination pads are made to AMP specifica- tions. Plugs will mate with AMPMODU Mod. II pc board connectors. FCC contacts can be crimped anywhere on a cable to allow daisy chaining. FCC must conform to IPC-FC-220, Tol. Class IV. Insulation material must be polyes- ter or polyimide.
2 86670-1									
Plug Without Mounting Ears									
3 1-86671-1									
4 86671-5									
5 86671-3									
6 86671-7									
7 1-86671-3									
8 86671-9									
9 86671-1		-55 To +105							
Plug With Mounting Ears									
10 86577-3	None	-55 To +150		None Required	None Required		Stock	IPC-FC-218	
(Continued)									

Note 1: When round wires are used, the following tools are needed: Round Wire Hand Crimping Tool #90222-2, Auto. Crimping Machine for Contacts #687348-1, Extraction Tools for Contacts #91047.

CHART III - 3. CONNECTORS: FLAT TO FLAT, PLUGS

IDENTIFICATION				ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: H×W×D Or Dia×L (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Note 1													
Note 2													
Note 3													
1	AMP (Con.) Note 1 <u>Plug, Receptacle, MIL-C-28754 Tuning Fork</u> 86597-3	IV-1	300	3	5000	25	See Military Specification For Receptacle Dimensions	40	0.100	2.1	0.003×0.060-0.065	2	4.4
Note 4													
Note 5													
2	Ansley Note 4 <u>Plug Assembly For D. I. P. Sockets</u> 614004	IV-27	100	1.75	No Data	6.0	No Data	14	0.100 ×0.300	0.6	0.005×0.020	1	No Data
3	<u>Matrix Plug For 0.100 Grid</u> <u>Matrix Receptacle For 0.100 Grid</u>		300	1.1	5000/10 ft Cable	No Data	No Data	20	0.100	2.15	0.062×0.003	1	No Data
Note 7													
Note 8													
4	Belling And Lee Notes 6, 7 <u>Plug, Flexicon Connector Series, Vendor No. 11385</u>	<u>Receptacle, Flexicon Connector Series, Vendor No. 11385</u>	600	3	10 000	5 Max	No Data	50 Max	0.100	5 Max	Standard: 0.002×0.062	1	No Data

Note 1: Refer to the last column, "Remarks," for additional mating possibilities.

Note 2: Round wire 24-22 AWG may be used.

Note 3: Weight is approximate.

Note 4: The plug assembly for D.I.P. sockets consists of a jumper cable and 2 or more plugs. Number 614004 is the basic catalog number.

Note 5: Plugs with 16 contacts are also available for D.I.P. sockets.

Note 6: Belling and Lee of Enfield, England is represented in the U.S. by Ercona Corporation. The vendor number is Ercona's.

Note 7: Refer to "Remarks" column for mating possibilities.

Note 8: Connectors can be layered.

CHART III - 3. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
AMP (Con.)			Note 1			Note 2	Note 2		
Plug, NAFI Style Crimp Blade Housing 86597-3	Crimp	Removable	Blade	Phosphor Bronze	50 Gold Over 30 Nickel	11400	2300	500	No Data
1									
Ansley									
Plug Assembly For D.I.P. Sockets 614004	Solder	Fixed	Pin	Phosphor Bronze	30 Gold Over Nickel Flash	60 Av	30 Av	1000	No Data
2									
Matrix Plug For 0.100 Grid	Solder Or Weld	Fixed	Pin	No Data	No Data	No Data	No Data	No Data	No Data
3									
Belling And Lee			Note 3						
Plug, Flexicon Connector Series, Vendor No. 11385	FCC: Solder, Weld; Board; Solder	Fixed	Pin Or Socket	Copper Alloy	200 Gold Over Nickel	No Data	No Data	No Data	No Data
4									

Note 1: Solder tab contacts for permanent printed circuit board terminations are also available.

Note 2: Mating force measurements are maximum, unmating are minimum.

Note 3: If round wire is used termination is by wire wrap or solder.

CHART III - 3. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP (Con.)	Note 1									
1 Plug, NAFI Style Crimp Blade 86597-3	0.23x2.10x0.63	Diallyl- phthalate Per MIL-M-14-F Type STGF	None	Terminated To Contact	Dual In-line	None	None	None	None	None
Ansley										
2 Plug Assembly For D.I.P. Sockets 614004	0.40x0.74x0.44	40% Glass- Filled Nylon	None	None	Dual In-line	None	None	Molded In	None	None
3 Matrix Plug For 0.100 Grid	No Data	Nylon Fiberfil J2/30	None	None	One Row	None	None	Fold Interlock	None	None
Belling And Lee										
4 Plug, Flexicon Connector Series, Vendor No. 11385	0.2x Modulex 1.5	Polycarbonate	None	None	One Row	Screw, Shielded and Guided Pins and Sockets	Screw, Adhesive, Wave Solder (To Board)	No Data	No Data	None

Note 1: Dimensions exclude locking and mounting screws and spring clips.

CHART III - 3, CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1	AMP (Con.) <u>Plug, NAFI Style Crimp Blade</u> 86597-3	None -55 To +150	Note 1 FCC Hand Crimp- ing Tool #90236-1, FCC Auto. Crimp- ing Machine #693790-2, Extrac- tion Tools For Contacts #91047	None Required	None Required	Military Uses, Computers And Related Equipment, Consumer Products	Stock	None	Type Flat To Flat Connections: FCC To Aluminum Panel. Round wire and FCC can also be intermixed in this plug. All hardware for a 40-contact MIL-C-28754 Type II connector insert will fit the housing of this plug.
2	Ansley <u>Plug Assembly For D.I.P. Sockets</u> 614004	None 80 Max	No Data	No Data	No Data	No Data	Stock	No Data	Type Connections: FCC To Component
3	Matrix <u>Plug For 0.100 Grid</u>	None 100 Max	Available As Assembled Or Would Require Heat Forming Fixture For Cable Strain Relief	Mechanical	Tin If Conductors Are Soldered	No Data	Stock	IPC-FC-220 IPC-FC-218A	Type Connections: FCC To FCC
4	Belling And Lee <u>Plug, Flexicon Connector Series, Vendor No. 11385</u>	No Data -40 To +120	None	No Data	No Data	Computers And Telecommunica- tion Equipment	Expected Production Date 1971	No Data	Flat To Flat Connections: FCC To FCC And Board. FCC to round wire connections are also possible.

Note 1: When round wires are used, the following tools are needed: Round Wire Hand Crimping Tool #90222-2, Auto. Crimping Machine for Contacts #687348-1. Extraction Tools for Contacts #91047.

CHART III - 4. CONNECTORS: FLAT TO FLAT, PLUGS

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T x W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Berg	Note 1		Note 2	Note 2	Note 2	Note 2					Note 3		
1 Plug, Universal Series	Receptacle, Universal Series		300	1	5000	15	2.1x0.2x1.4	17	0.050	1.0	0.002x0.025	1	No Data
2			300	↑	↑	↑	2.1x0.2x2.4	37	0.050	2.0	0.002x0.025	↑	↑
3			300				2.1x0.2x3.4	57	0.050	3.0	0.002x0.025		
4 Plug, Universal Series	Receptacle, Universal Series		600	↑	↑	↑	2.1x0.2x1.4	12	0.075	1.0	0.003x0.026		
5				↑			2.1x0.2x2.4	25	0.075	2.0	0.003x0.026		
6				1			2.1x0.2x3.4	38	0.075	3.0	0.003x0.026		
7 Plug, Universal Series	Receptacle, Universal Series		600	3			2.1x0.2x1.4	9	0.100	1.0	0.003x0.062	↑	↑
8				3	5000	15	2.1x0.2x2.4	19	0.100	2.0	0.003x0.062	↑	↑
9			600	3			2.1x0.2x3.4	29	0.100	3.0	0.003x0.062	1	No Data
ITT Cannon	Note 4	IV-53					Note 5				Note 6		
10 Plug, Flat Backshell	Receptacle, Backshell; Flat (FC*3) Box Mounted (FC*5, FC*6)		600	3	5000	20	0.71 0.69x1.45x2.24 0.71 0.69x1.45x2.04 0.71 0.69x1.45x2.04	7, 6, or 4 Per Cable Layer	0.050 With 7, 0.075 With 6, 0.100 With 4	0.5	0.005x0.025 With 0.050 Contact Spacing, 0.005x0.040 With 0.075, 0.006x0.065 With 0.100	1, 2, or 3	No Data
	FC*1B*****												
	FC*5B*****												
	FC*6B*****												
(Continued)													

Note 1: These FCC plugs and receptacles are in development. The in-house name applied to them, as well as developmental FCC transitions, is "Universal Connectors."

Note 2: In-process testing.

Note 3: Round wire AWG 32, 30, and 26 can also be used in place of the flat conductor sizes 0.002x0.025, 0.003x0.026, and 0.003x0.062.

Note 4: The asterisks within part numbers indicate variable characteristics. A complete part number explanation can be found in Section IV, "Manufacturers' Data." For information on additional mating possibilities, refer to "Remarks" column.

Note 5: Depth measurements are maximum.

Note 6: Round wire sizes 24-30 AWG can be used.

CHART III - 4. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (min.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
Berg Plug, Universal Series	Force-fit	Fixed	Pin	Beryllium Copper	For All Series; 50 Gold Over Nickel Flash	1700	1700	Note 1 500	125
1									
2									
3									
4									
5									
6									
7									
8									
9	Force-fit	Fixed	Pin	Beryllium Copper		900	900	500	125
Plug, Universal Series						1200	1200		
4						2500	2500		
5						3800	3800		
6									
7									
8									
9									
ITT Cannon Plug, Flat Backshell	Note 2								
10	Weld Or Solder	Removable Wafer With Fixed Contacts	Pin Or Socket	No Data	50 Gold Min	2700 For Shell, Add 230 Per Contact	900 For Shell, Add 170 Per Contact	500	127
FC*1B*****									
(Continued)									

Note 1: In-process testing.

Note 2: If round wire is used for flat to round or round to round connections, termination is by crimping.

CHART III - 4. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Berg										
1	0.2x1.4x0.94	For All Series: Molded, Material Data Not Available	None	None	In-line	Screw	Screw	For All Series; Provided By Housing	None	Polarized
2	0.2x2.4x0.94									
3	0.2x3.4x0.94									
4	0.2x1.4x0.94	Universal Series	None	None	In-line	Screw	Screw	None	None	Polarized
5	0.2x2.4x0.94									
6	0.2x3.4x0.94									
7	0.2x1.4x0.94	Universal Series	None	None	In-line	Screw	Screw	None	None	Polarized
8	0.2x2.4x0.94									
9	0.2x3.4x0.94									
ITT Cannon	Note 1									
Plug, Flat Backshell										
FC*1B*****	0.55 0.53x1.45x1.35	Aluminum Alloy	Cadmium Plate	Optional Bars For Flat Cable Backshell	1, 2, Or 3 Rows In-line	Jackscrews	Side Mount Blocks. Also See Mating Part	None	Yes	Wafers Are Positioned And Polarized. The Shell Has Key Clips For 9 Positions
10										
(Continued)										

Note 1: Depth measurements are maximum.

CHART III - 4. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1 Berg Plug, Universal Series	For All Series: Encapsula- ted, See Housing Material	-60 To +150	None	Mechanical	For All Series: 0.00005 in. Gold Per MIL G45204 Type II	Commercial Uses	Expected Produc- tion Date For All Series: 1971	MIL-C-55544	Type Flat To Flat Connections For Universal Plugs: FCC To FCC. As round wire can also be used in these parts, flat to round and round to round connections are also possible.
2									
3									
4 Plug, Universal Series									
5									
6									
7 Plug, Universal Series									
8									
9						Commercial Uses		MIL-C-55544	
ITT Cannon Plug, Flat Backshell									
10 FC* 1B***** (Continued)	Interfacial and Periph- eral, Envi- ronmental, Silicone Rubber	-65 To +125	No Data	No Data	No Data	Military: Missiles	Not Tooled	MIL-C-55544	Type Flat To Flat Connections: FCC To FCC. FC* 1 plugs also mate for flat to round and round to round connections. The removable wafer concept used by ITT Cannon allows for inter- mixing of round wire and FCC in any housing. An RFI seal is provided for the shielded version.

CHART III - 5. CONNECTORS: FLAT TO FLAT, PLUGS

[illegible]

Note 1: The asterisks within part numbers indicate variable characteristics. A complete part number explanation can be found in Section IV, "Manufacturers' Data." For information on additional mating possibilities, refer to the last column.

Note 2: Depth Measurements are maximum.

CHART III - 5. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
ITT Cannon (Con. Plug, Flat Backshell (Con.)	Note 1								
1 FC*1C*****	Weld Or Solder	Removable Wafer With Fixed Contacts	Pin Or Socket	No Data	50 Gold Minimum	Shell: 3600, Add 230 Per Contact	Shell: 1800, Add 170 Per Contact	500	127
2 FC*1D*****						Shell: 4500, Add 230 Per Contact	Shell: 2700, Add 170 Per Contact		
3 FC*1E*****						Shell: 5400, Add 230 Per Contact	Shell: 3600, Add 170 Per Contact		
4 FC*1F*****						Shell: 6300, Add 230 Per Contact	Shell: 4500, Add 170 Per Contact		
5 FC*1G*****	Weld Or Solder	Removable Wafer With Fixed Contacts	Pin Or Socket	No Data	50 Gold Minimum	Shell: 300, Add 230 Per Contact	Shell: 5400, Add 170 Per Contact	500	127

Note 1: If round wire is used for flat to round or round to round connections, termination is by crimping.

CHART III - 5. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
ITT Cannon (Con.)	Note 1									
<u>Plug. Flat Backshell (Con.)</u>										
1 FC*1C*****	$\frac{0.55}{0.53} \times 1.90 \times 1.35$	Aluminum Alloy	Cadmium Plate	Optional Bars For Flat Cable Backshell	1, 2, Or 3 Rows In-line	Jackscrews	Side Mount Blocks, Also See Mating Part	None	Yes	For Series: Wafers Are Positioned And Polarized: The Shell Has Key Clips For 9 Positions. FC*1F***** Can Also Be Obtained With Reversible Wafer Assemblies.
2 FC*1D*****	$\frac{0.55}{0.53} \times 2.40 \times 1.35$									
3 FC*1E*****	$\frac{0.55}{0.53} \times 2.90 \times 1.35$									
4 FC*1F*****	$\frac{0.55}{0.53} \times 3.40 \times 1.35$									
5 FC*1G*****	$\frac{0.55}{0.53} \times 3.90 \times 1.35$	Aluminum Alloy	Cadmium Plate	Optional Bars For Flat Cable Backshell	1, 2, Or 3 Rows In-line	Jackscrews	Side Mount Blocks, Also See Mating Part	None	Yes	

Note 1: Depth measurements are maximum.

CHART III - 5. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
ITT Cannon (Con.)									
Plug, Flat Backshell (Con.)									
1 FC*1C*****	For Series: Interfacial & Peripheral, Environmental, Silicone Rubber	-65 To +125	No Data	No Data	No Data	Military: Missiles	Tooled	MIL-C-55544	Type Flat To Flat Connections: FCC To FCC. FC*1 plugs also mate for flat to round and round to round connections. The removable wafer concept used by ITT Cannon allows for intermixing of round wire and FCC in any housing. An RFI seal is provided for the shielded version.
2 FC*1D*****							Not Tooled		
3 FC*1E*****							Not Tooled		
4 FC*1F*****							Tooled		
5 FC*1G*****		-65 To +125	No Data	No Data	No Data	Military: Missiles	Not Tooled	MIL-C-55544	

CHART III - 6. CONNECTORS: FLAT TO FLAT, PLUGS

IDENTIFICATION				ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufac-turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TlxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Kings Note 1	Notes 1, 2	IV-67					Note 3						
Plug	Jack Receptacle												
1 F5510-170-00	F3510-170-00		750	2	No Data	20	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{16}$	17	0.050	1.000	0.0025x0.025	1	30
2 F5510-171-00	F3510-171-00						$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{16}$	17		1.000			30
3 F5510-171-00	F3510-171-00						$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{16}$	22		1.250			35
4 F5510-220-00	F3510-220-00						$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{16}$	22		1.250			35
5 F5510-221-00	F3510-221-00						$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{16}$	27		1.500			40
6 F5510-270-00	F3510-270-00						$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{16}$	27		1.500			40
7 F5510-271-00	F3510-271-00						$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{16}$	32		1.750			45
8 F5510-320-00	F3510-320-00		750	2	No Data	20	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{16}$	32	0.050	1.750	0.0025x0.025	1	45
Method Note 4	Note 4												
Plug	Receptacle												
9 60-6006-1100	90-&91-6006-1200		600	5	5000 Min	6 Max	0.34x1.8x0.94	6	0.156	1.0	0.003x0.078	1	No Data
10 60-6008-1100	90-&91-6008-1200						0.34x2.1x0.94	8		1.3			
11 60-6010-1100	90-&91-6010-1200						0.34x2.4x0.94	10		1.6			
12 60-6012-1100	90-&91-6012-1200						0.34x2.7x0.94	12		2.0			
13 60-6015-1100	90-&91-6015-1200						0.34x3.2x0.94	15		2.4			
14 60-6018-1100	90-&91-6018-1200						0.34x3.7x0.94	18		2.9			
15 60-6022-1100	90-&91-6022-1200						0.34x4.3x0.94	22		3.5			
16 60-6024-1100	90-&91-6024-1200		600	5	5000 Min	6 Max	0.34x4.6x0.94	24	0.156	3.8	0.003x0.078	1	No Data
(Continued)													

Note 1: Refer to the last column, "Remarks," for information on additional mating possibilities.

Note 2: Receptacle pairs differ in FCC insulation thickness.

Note 3: Members of each receptacle pair per plug have the same dimensions.

Note 4: Components can also be obtained in component and FCC assemblies to meet standard and special requirements.

CHART III - 6. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
Kings									
Plug									
1 F5510-170-00	Insulation Piercing	Removable	Sliding	Beryllium Copper	50 Gold	No Data	No Data	250	No Data
2 F5510-171-00									
3 F5510-220-00	Insulation Piercing	Removable	Sliding	Beryllium Copper	50 Gold	No Data	No Data	250	No Data
4 F5510-221-00									
5 F5510-270-00	Insulation Piercing	Removable	Sliding	Beryllium Copper	50 Gold	No Data	No Data	250	No Data
6 F5510-271-00									
7 F5510-320-00	Insulation Piercing	Removable	Sliding	Beryllium Copper	50 Gold	No Data	No Data	250	No Data
8 F5510-321-00									
Methods									
Plug									
9 60-6006-1100	Solder	Fixed	Blade	Copper Alloy 260	20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
10 60-6008-1100									
11 60-6010-1100	Solder	Fixed	Blade	Copper Alloy 260	20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
12 60-6012-1100									
13 60-6015-1100	Solder	Fixed	Blade	Copper Alloy 260	20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
14 60-6018-1100									
15 60-6022-1100	Solder	Fixed	Blade	Copper Alloy 260	20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
16 60-6024-1100									
(Continued)									

Note 1: Other platings are available upon request for Series 60 plugs.

CHART III - 6. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Kings										
Plug										
1 F5510-170-00	$\frac{5}{16} \times 2 \frac{1}{16} \times \frac{11}{16}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Offset
2 F5510-171-00	$\frac{5}{16} \times 2 \frac{1}{16} \times \frac{11}{16}$									
3 F5510-220-00	$\frac{5}{16} \times 2 \frac{5}{16} \times \frac{11}{16}$									
4 F5510-221-00	$\frac{5}{16} \times 2 \frac{5}{16} \times \frac{11}{16}$									
5 F5510-270-00	$\frac{5}{16} \times 2 \frac{9}{16} \times \frac{11}{16}$									
6 F5510-271-00	$\frac{5}{16} \times 2 \frac{9}{16} \times \frac{11}{16}$									
7 F5510-320-00	$\frac{5}{16} \times 2 \frac{13}{16} \times \frac{11}{16}$									
8 F5510-321-00	$\frac{5}{16} \times 2 \frac{13}{16} \times \frac{11}{16}$									
Methods										
Plug										
9 60-6006-1100	0.34x1.8x0.47	Diallylphthalate	None	None	One Row	None	Screws	None	Yes, Poly- imide Resin	In Contact Position
10 60-6008-1100	0.34x2.1x0.47									
11 60-6010-1100	0.34x2.4x0.47									
12 60-6012-1100	0.34x2.7x0.47									
13 60-6015-1100	0.34x3.2x0.47									
14 60-6018-1100	0.34x3.7x0.47									
15 60-6022-1100	0.34x4.3x0.47									
16 60-6024-1100	0.34x4.6x0.47									
(Continued)										

CHART III - 6. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part		ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS		
		Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish						
<u>Kings</u>												
	<u>Plug</u>											
1	F5510-170-00	For Series: Gasket, En- vironmental, Silicone	-55 To +180	None	None Required	None	Military And Com- mercial Uses For Series: Computers, Communications, Data Processing Equipment, Office Equipment Includ- ing Copiers, Aircraft	1 Year Production	Series Is Designed To Applicable Military Specifica- tions. Not Quali- fied At This Time.	Type Flat To Flat Connections: FCC To FCC. Plugs also mate for flat to round connec- tions. 0.012 in. cable thickness for parts F5510-170-00, -220- -, -270-, and -320-; 0.016 in. cable thickness for parts F5510-171-00, -221-, -271-, and -321-.		
2	F5510-171-00											
3	F5510-220-00											
4	F5510-221-00											
5	F5510-270-00		-55 To +180	None	None Required	None		1 Year Production				
6	F5510-271-00											
7	F5510-320-00											
8	F5510-321-00											
<u>Methode</u>												
	<u>Plug</u>											
9	60-6006-1100	None	-65 To +150	None	Mechanical	Tin	For Part Series: Military, Aero- space, Communi- cations	3 To 5 Weeks	IPC-FC-218/5	Type Connections For Series: FCC To FCC.		
10	60-6008-1100											
11	60-6010-1100											
12	60-6012-1100											
13	60-6015-1100		-65 To +150	None	Mechanical	Tin		3 To 5 Weeks	IPC-FC-218/5			
14	60-6018-1100											
15	60-6022-1100											
16	60-6024-1100											
(Continued)												

CHART III - 7. CONNECTORS: FLAT TO FLAT, PLUGS

IDENTIFICATION				ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufac-turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Method (Con.) Notes 1, 2													
Dual Plug													
1	63-6212-1100	94-6112-1200	600	5	5000 Min	6 Max	1.0×2.7×0.94	12	0.156	1.0	0.003×0.078	2	No Data
2	63-6216-1100	94-6116-1200					1.0×3.0×0.94	16		1.3			
3	63-6220-1100	94-6120-1200					1.0×3.3×0.94	20		1.6			
4	63-6224-1100	94-6124-1200					1.0×3.6×0.94	24		2.0			
5	63-6230-1100	94-6130-1200					1.0×4.1×0.94	30		2.4			
6	63-6236-1100	94-6136-1200					1.0×4.6×0.94	36		2.9			
7	63-6244-1100	94-6144-1200					1.0×5.2×0.94	44		3.5			
8	63-6248-1100	94-6148-1200	600	5	5000 Min	6 Max	1.0×5.5×0.94	48	0.156	3.8	0.003×0.078	2	No Data
Plug													
9	189-140	Back Panel System	200	3	5000 Min	10 Max	Not Applicable	20	0.100	2.0	0.003×0.065	1	No Data
Microdot Note 3													
Note 3 IV-79													
Plug "Flexmate" Series													
10	MCD(**)-9P(*****)	MCD(**)-9S(*****)	750	3	5000	10	0.2×0.78×1.125	9	0.050	0.30	0.003×0.025	2	2.57
11	MCD(**)-15P(*****)	MCD(**)-15S(*****)					0.2×0.9×1.125	15		0.50			3.13
12	MCD(**)-21P(*****)	MCD(**)-21S(*****)					0.2×1.08×1.125	21		0.70			6.05
13	MCD(**)-25P(*****)	MCD(**)-25S(*****)					0.2×1.18×1.125	25		0.80			6.80
14	MCD(**)-31P(*****)	MCD(**)-31S(*****)	750	3	5000	10	0.2×1.33×1.125	31	0.050	0.95	0.003×0.025	2	7.73
(Continued)													

Note 1: Plugs in the 63 Series consist of two 60 Series plugs commonly mounted.

Note 2: Components can also be obtained in component and FCC assemblies to meet standard and special requirements.

Note 3: The asterisks within part numbers indicate variable characteristics. See Section IV, "Manufacturers' Data," for an explanation of part nomenclature. For information on additional mating possibilities, refer to the last column, "Remarks."

CHART III - 7. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
Methode (Con.)									
Dual Plug									
1 63-6212-1100	Solder	Fixed	Blade	Copper Alloy 260	20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
2 63-6216-1100									
3 63-6220-1100									
4 63-6224-1100									
5 63-6230-1100									
6 63-6236-1100									
7 63-6244-1100									
8 63-6248-1100	Solder	Fixed	Blade	Copper Alloy 260	20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
Plug									
9 189-140	Solder	Fixed	Blade	Copper Alloy 260	50 Gold Over Copper	No Data	No Data	500	Contact Vendor For Data
Microdot									
Plug "Flexmate" Series									
10 MCD(**)-9P(*****)	Weld Or Solder	Removable Wafer With Fixed FCC	Pin ("Twist/ Con")	Beryllium Copper	100 Gold Over Copper Flash	1000	1000	500	No Data
11 MCD(**)-45P(*****)						1700	1700		
12 MCD(**)-21P(*****)						2400	2400		
13 MCD(**)-25P(*****)						2800	2800		
14 MCD(**)-31P(*****)	Weld Or Solder	Removable Wafer With Fixed FCC	Pin ("Twist/ Con")	Beryllium Copper	100 Gold Over Copper Flash	3500	3500	500	No Data
(Continued)									

CHART III - 7. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Methode (Con.)										
<u>Dual Plug</u>		Diallylphthalate	None	None	Dual Row In-line	None	Screw	None	Yes, Poly- imide Resin	In Contact Position
1 63-6212-1100	1.0x2.7x0.47									
2 63-6216-1100	1.0x3.0x0.47									
3 63-6220-1100	1.0x3.3x0.47									
4 63-6224-1100	1.0x3.6x0.47									
5 63-6230-1100	1.0x4.1x0.47									
6 63-6236-1100	1.0x4.6x0.47									
7 63-6244-1100	1.0x5.2x0.47									
8 63-6248-1100	1.0x5.5x0.47	Diallylphthalate	None	None	Dual Row In-line	None	Screw	None	Yes, Poly- imide Resin	In Contact Position
<u>Plug</u>		Diallylphthalate	None	None	One Row	None	None	None	Yes, Poly- imide Resin	None
9 189-140	0.07x2.0x0.17									
Microdot										
<u>Plug, "Flexmate" Series</u>		For Series: Stainless Steel Type 304, Per QQS-766	For Series: Passivated Per MIL-F-14072	To Contacts	2 Rows Staggered	Screws With Lock Wires	Available For Series: Screws Or Jack Screws	Back Shell	Yes, Epoxy (3M)	For Series: Keystone "D" Shape; Hex Inserts For 36 Positions
10 MCD(**)-9P(*****)	0.2x0.78x0.67									
11 MCD(**)-15P(*****)	0.2x0.9x0.67									
12 MCD(**)-21P(*****)	0.2x1.08x0.67									
13 MCD(**)-25P(*****)	0.2x1.18x0.67									
14 MCD(**)-31P(*****)	0.2x1.33x0.67									
(Continued)										

CHART III - 7. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
Methode (Con.)									
Dual Plug									
1 63-6212-1100	None	-65 To +150	None	Mechanical	Tin	For Part Series: Military, Aero- space, Communi- cations	3 To 5 Weeks	IPC-FC-218/6	Type Connections For Series: FCC To FCC
2 63-6216-1100									
3 63-6220-1100									
4 63-6224-1100									
5 63-6230-1100	None	-65 To +150	None	Mechanical	Tin	For Series: Military, Aero- space, Communi- cations	3 To 5 Weeks	IPC-FC-218/6	Type Connections: FCC To Component
6 63-6236-1100									
7 63-6244-1100									
8 63-6248-1100									
Plug									
9 189-140	None	-65 To +150	Positioning Fixture	Not Required	Nickel	Military, Aero- space, Communi- cations	Experimental Stage	Navord 2315190	Type Connections: FCC To Component
Microdot									
Plug, "Flexmate" Series									
10 MCD(**)-3P(****)	None	-55 To +149	None	Mechanical	Optional	For Series: Aerospace, and Commercial; Aircraft, Missiles, Computers	Special Order	MIL-C-55544	Type Flat To Flat Connections: FCC To FCC Within "Flexmate" Connector Series. In addition, "Flexmate" plugs and receptacles are intermountable and intermateable with the round wire "Micromate" connector series.
11 MCD(**)-15P(****)									
12 MCD(**)-31P(****)									
13 MCD(**)-25P(****)									
14 MCD(**)-31P(****)	None	-55 To +149	None	Mechanical	Optional		Special Order	MIL-C-55544	
(Continued)									

CHART III - 8. CONNECTORS: FLAT TO FLAT, PLUGS

IDENTIFICATION				ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufac-turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Microdot (Con.) Note 1	Note 1	IV-79											
Plug, "Flexmate" Series (Con.)													
1	MCD(**)-37P (*****)	MCD(**)-37S(****)	750	3	5000	10	0.2x1.48x1.125	37	0.050	1.10	0.003x0.025	2	8.71
2	MCD(**)-51P (*****)	MCD(**)-51S(****)	750	3	5000	10	0.2x1.43x1.125	51	0.050	1.05	0.003x0.025	3	9.26

Note 1: The asterisks within part numbers indicate variable characteristics. See Section IV, "Manufacturers' Data," for an explanation of part nomenclature. For information on additional mating possibilities, refer to the last chart column, "Remarks."

Note 2: Refer to the last column, "Remarks," for additional mating possibilities.

Note 3: A molded-on plug, NASA-MSFC number 50M72604, is available which differs from plug number 50M72637 primarily in the lower operating temperature characteristics. Also, special molding equipment is required for plug assembly. Refer to Section IV, "Manufacturers' Data," for more information.

Note 4: The mated connector assembly consists of one receptacle and two plugs for feedthrough and adapter usage.

Note 5: Maximum dimensions are given.

CHART III - 8. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
Microdot (Con.)									
Plug, "Flexmate" Series (Con.)									
1 MCD(**)-37P(*****)	Weld Or Solder	Removable Wafers With Fixed FCC	Pin ("Twist/ Con")	Beryllium Copper	100 Gold Over Copper Flash	4200	4200	500	No Data
2 MCD(**)-51P(*****)	Weld Or Solder		Pin ("Twist/ Con")	Beryllium Copper	100 Gold Over Copper Flash	5800	5800	500	No Data
NASA									
Plug									
3 50M72637-1	For Series: Contacts Formed From Cable Conductors	Fixed	Sliding	Copper	100 Gold On 30 Nickel	1300	900	500	133
4 50M72637-3						2300	1100		
5 50M72637-5						2900	1600		
6 50M72637-7						3600	2000		
7 50M72637-9		Fixed	Sliding	Copper	100 Gold On 30 Nickel	4500	2500		133
(Continued)									

CHART III - 8. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Microdot (Con.)										
Plug, "Flexmate" Series (Con.)										
1 MCD(**)-37P (*****)	0.2x1.48x0.67	For Series: Stainless Steel Type 304, Per QQS-766	For Series: Passivated Per MIL- F-14072	To Contacts To Contacts	2 Rows Staggered 3 Rows Staggered	Screws With Lock Wires Screws With Lock Wires	Available For Series: Screws Or Jack Screws	Back Shell Back Shell	Yes, Epoxy (3M) Yes, Epoxy (3M)	For Series: Keystone "D" Shape; Hex Inserts For 36 Positions
2 MCD(**)-51P (*****)	0.2x1.43x0.67									
NASA										
Plug										
3 50M72637-1	0.56x1.41x0.60	For Series: Glass-filled Epoxy Compound	None	To Contact	Dual In-line	Locking: Clip, Safety: Lockwire	See Mating Part	None	Yes For Series: Polyurethane Compound Or Epoxy	Rectangular Key, One Position
4 50M72637-3	0.56x1.86x0.60									
5 50M72637-5	0.56x2.38x0.60									
6 50M72637-7	0.56x2.91x0.60									
7 50M72637-9	0.56x3.36x0.60									
(Continued)										

CHART III - 8. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
Microdot (Con.)									
Plug, "Flexmate" Series (Con.)									
1 MCD(##)-37P (####)	None	-55 To + 149	None	Mechanical	Optional	Aerospace and Commercial: Aircraft, Missiles, Computers	Special Order	MIL-C-55544 MIL-C-55544	Type Flat To Flat Connections: FCC To FCC Within "Flexmate" Connector Series. In addition, "Flexmate" plugs and receptacles are intermountable and intermateable with the round wire "Micromate" connector series.
2 MCD(##)-51P (####)	None	-55 To + 149	None	Mechanical	Optional				
NASA							Note 1		
Plug									
3 50M72637-1	For Series: Peripheral, Environ- mental, Silicone Rubber	-65 To + 200	None	Mechanical Or Chemical	Gold On Nickel	Military And Aerospace	Series For NASA And Contractors As GFE	MIL-C-55544 MIL-C-55544	Type Flat To Flat Connections For Series: FCC To FCC And Flexible Printed Circuits. Plugs can be mated with additional receptacles for FCC to round wire connections.
4 50M72637-3									
5 50M72637-5									
6 50M72637-7									
7 50M72637-9		-65 To + 200	None	Mechanical Or Chemical	Gold On Nickel	Military And Aerospace			
(Continued)									

Note 1: GFE: Government Furnished Equipment.

CHART III - 9. CONNECTORS: FLAT TO FLAT, PLUGS

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
NASA (Con.)	Note 1	IV-97											
<u>Plug</u>	<u>Receptacles, Bulkhead Sq. Flange Mount</u>												
1 50M72607	50M72629-1		300	3	500	10	0.88x0.88x1.55 1.00Dx1.55	6	0.075	0.25	0.004x0.040	2	3.2
	<u>Bulkhead Single Hole Mount</u> 50M72630-1												
<u>Plug</u>	<u>Receptacles, Bulkhead Sq. Flange Mount</u>												
2 50M72606	50M72629-2		300	3	500	10	1.00x1.00x1.55 1.38Dx1.55	12	0.075	0.50	0.004x0.040	2	6.5
	<u>Bulkhead Single Hole Mount</u> 50M72630-2												

Note 1: Mated connector assembly consists of one receptacle and two plugs for feed-through usage.

CHART III - 9. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
NASA (Con.)									
<u>Plug</u>									
1	50M72607	Contacts Formed From Cable Conductors	Fixed	Sliding	Copper	100 Gold on 30 Nickel	400 800	200 400	133
2	50M72606	Contacts Formed From Cable Conductors	Fixed	Sliding	Copper	100 Gold on 30 Nickel	400 800	200 400	133

CHART III - 9. CONNECTORS: FLAT TO FLAT, PLUGS

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
1										
NASA (Cont.)										
Plug										
50M72607	0.63Dx0.58	Copper Shield Over Polycarbonate Resin	Conductive Protective Coating	To Shell	Dual In-Line	Shell Nut, Safety Lockwire	See Mating Part	None	Yes, Epoxy	Rectangular Key, One Position
2										
Plug										
50M72606	0.94Dx0.58	Copper Shield Over Polycarbonate Resin	Conductive Protective Coating	To Shell	Dual In-Line	Shell Nut, Safety Lockwire	See Mating Part	None	Yes, Epoxy	Rectangular Key, One Position

CHART III - 9. CONNECTORS: FLAT TO FLAT, PLUGS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
NASA (Con.)							Note 1		
Plug									
1	50M72607	Peripheral, Environ- mental, Silicone Rubber	-65 To +100	Injection Molding Machine & Required Mold	Mechanical or Chemical	Gold on Nickel	Military and Aerospace	NASA & Contrac- tors As GFE MIL-C-55544	Type Flat To Flat Con- nections: FCC to FCC and Flexible Printed Circuits. Plugs can be mated with additional receptacles for FCC to round wire connections.
2	50M72606	Peripheral, Environ- mental, Silicone Rubber	-65 To +100	Injection Molding Machine & Required Mold	Mechanical or Chemical	Gold on Nickel	Military and Aerospace	NASA & Contrac- tors As GFE MIL-C-55544	

Note 1: GFE: Government Furnished Equipment

CHART III - 10. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION				ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufac-turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)	
AMP	Note 1	Note 1					Note 2	Note 3	Note 4				Note 4	
Receptacle With Mounting Ears	Plug With Mounting Ears: 86562, Without: 86555	IV-1												
1 86563-1	86562-3		300	3	5000	25	0.25×1.66×1.21	9	0.100	1.0	0.003×0.060-0.065	1	1.7	
2 86563-2	86555-2						0.25×1.66×1.21			2.0			3.4	
3 86563-3	86562-4						0.25×2.66×1.21	19					5.1	
4 86563-4	86555-1						0.25×2.66×1.21	29		3.0			5.8	
	86562-2						0.25×3.66×1.21	33		3.4				
	86555-3						0.25×3.66×1.21							
	86562-1						0.25×4.06×1.21							
	86555-4						0.25×4.06×1.21							
Receptacle Without Mounting Ears	Plug With Mounting Ears: 86562, Without: 86555													
5 86572-1	86562-3						0.25×1.66×1.21	9		1.0			1.7	
6 86572-2	86555-2						0.25×1.15×1.21			2.0			3.4	
7 86572-3	86562-4						0.25×2.66×1.21	19					5.1	
8 86572-4	86555-1						0.25×2.66×1.21	29		3.0			5.8	
	86562-2						0.25×3.66×1.21	33		3.4				
	86555-3						0.25×3.66×1.21							
	86562-1						0.25×4.06×1.21							
	86555-4						0.25×3.55×1.21							
Receptacle With Mounting Ears	Plug With Mounting Ears: 86670, Without: 86671													
9 1-86672-1	1-86670-1						0.30×1.66×1.21	18		1.0		2	2.0	
10 86672-5	1-86671-1						0.30×1.66×1.21			1.1			2.2	
11 86672-3	86670-5						0.30×1.76×1.21	20					4.2	
12 86672-7	86671-5						0.30×1.76×1.21	38		2.0			4.5	
	86670-3		300	3	5000	25	0.30×2.66×1.21	40	0.100	2.1	0.003×0.060-0.065	2		
	86671-3						0.30×2.66×1.21							
	86670-7						0.30×2.76×1.21							
	86671-7						0.30×2.76×1.21							
(Continued)														

Note 1: FCC plugs and receptacles with and without mounting ears are part of the AMP-UNYT connector series. Refer to the last column, "Remarks," for additional mating possibilities.
 Note 2: Mated dimensions do not include locking and mounting screws and spring clips.

Note 3: Round wire AWG 24-22 may be used.
 Note 4: Weights are approximate.

CHART III - 10. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
AMP			Note 1		Note 2	Note 2	Note 2		
Receptacle With Mounting Ears									
1 86563-1	Crimp	Removable	Socket	Phosphor Bronze	For All Series: Gold (Available: 15, 30 or 50) Over 30 Nickel	1300	200	500	No Data
2 86563-2						2700	400		
3 86563-3						4100	600		
4 86563-4						4700	700		
Receptacle Without Mounting Ears									
5 86572-1						1300	200		
6 86572-2						2700	400		
7 86572-3						4100	600		
8 86572-4						4700	700		
Receptacle With Mounting Ears									
9 1-86672-1	Crimp	Removable	Socket	Phosphor Bronze		2600	400	500	No Data
10 86672-5						2800	400		
11 86672-3						5400	800		
12 86672-7						5700	900		
(Continued)									

Note 1: Solder tab contacts for permanent printed circuit board terminations are also available.
Note 2: Mating force measurements are maximum, unmating force measurements are minimum.

CHART III - 10. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP	Note 1									
Receptacle With Mounting Ears										
1 86563-1	0.25x1.68x0.60	Polysulfone Per MIL-P-46120	None	Terminated to Contact	Single Row	Available For Series: Spring Clip or Jack- screws	Screw	None	None	For All Series: Keying Plug Used in Any Socket
2 86563-2	0.26x2.66x0.60									
3 86563-3	0.25x3.66x0.60									
4 86563-4	0.25x4.06x0.60									
Receptacle Without Mounting Ears										
5 86572-1	0.25x1.15x0.60					Spring Clip	None			
6 86572-2	0.25x2.15x0.60									
7 86572-3	0.25x3.15x0.60									
8 86572-4	0.25x3.55x0.60	Polysulfone Per MIL-P-46120			Single Row	Spring Clip	None			
Receptacle With Mounting Ears										
9 1-86672-1	0.30x1.66x0.60	For Series: Self-Extinguishing Glass- Filled Nylon			Double Row In-line	Jackscrews	Screw			
10 86672-5	0.30x1.76x0.60									
11 86672-3	0.30x2.66x0.60									
12 86672-7	0.30x2.76x0.60		None	Terminated to Contact	Double Row In-line	Jackscrews	Screw	None	None	
(Continued)										

Note 1: Dimensions are approximate, locking and mounting screws and spring clips have been excluded.

CHART III - 10. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
AMP			Note 1						
Receptacle With Mounting Ears									
1 86563-1	None	-55 To +140	For All Series: FCC Hand Crimp- ing Tool #90236-1, FCC Auto. Crimp- ing Machine #693790-2, Extraction Tools For Contacts #91048	None Required	None Required	For All Series: Military Uses, Computers and Related Equip- ment, Consumer Products	Stock	IPC-FC-218	Type Flat To Flat Con- nections: FCC To FCC, Flexible Circuit, PC Board, And Aluminum Panel. Receptacles can also be used for flat to round and round to round connections. Refer to "Connectors: Flat To Round." For all recep- tacles with and without mounting ears, round wire and FCC can be intermixed in any housing. Flexible circuits can be crimp terminated with the receptacles provided the termination pads are made to AMP specifica- tions. FCC contacts can be crimped anywhere on a cable to allow daisy chain- ing. FCC must conform to IPC-FC-220, Tol. Class IV. Insulation material must be poly- ester or polyimide. Receptacles will mate with AMPMODU Mod. II, 0.025x0.025 posts for PC board applications.
2 86563-2									
3 86563-3									
4 86563-4									
Receptacle Without Mounting Ears									
5 86572-1									
6 86572-2									
7 86572-3									
8 86572-4		-55 To +140							
Receptacle With Mounting Ears									
9 1-86672-1		-55 To +105							
10 86672-5									
11 86672-3									
12 86672-7	None	-55 To +105		None Required	None Required		Stock	IPC-FC-218	
(Continued)									

Note 1: When round wire is used in the receptacles, the following tools are needed: Round Wire Hand Crimping Tool #90222-2, Auto. Crimping Machine for Contacts #687350-1, Extraction Tools for Contacts #91048.

CHART III - 11. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION				ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)	
AMP (Con.)	Note 1	IV-1					Note 2				Note 3		Note 4	
Receptacle With Mounting Ears (Con.)	Plug With Mounting Ears; 86670, Without: 86671													
1 1-86672-3	1-86670-3		300	3	5000	25	0.30x3.66x1.21	58	0.100	3.0	0.003x0.060+0.065	2	6.5	
2 86672-9	1-86671-3						0.30x3.66x1.21	66		3.4			7.3	
3 86672-1	86671-9						0.30x4.06x1.21	70		3.6			7.5	
	86670-1						0.30x4.26x1.21							
	86671-1						0.30x4.26x1.21							
Receptacle Without Mounting Ears	Plug With Mounting Ears; 86670, Without: 86671													
4 1-86673-1	1-86670-1						0.30x1.66x1.21	18		1.0			2.0	
5 86673-5	1-86671-1						0.30x1.15x1.21	20		1.1			2.2	
6 86673-3	86671-5						0.30x1.76x1.21	38		2.0			4.2	
7 86673-7	86670-3						0.30x2.66x1.21	40		2.1			4.5	
8 1-86673-3	86671-3						0.30x2.15x1.21	58		3.0			6.5	
9 86673-9	86670-7						0.30x2.76x1.21	66		3.4			7.3	
10 86673-1	1-86671-3						0.30x3.66x1.21	70		3.6			7.5	
	86670-9						0.30x3.15x1.21							
	86671-9						0.30x4.06x1.21							
	86670-1						0.30x3.55x1.21							
	86671-1						0.30x4.26x1.21							
Receptacle With Mounting Ears	Plug With Mounting Ears; 86577-3													
11 86578-3	86577-3		300	3	5000	25	0.29x2.66x1.21	38	0.100	2.0	0.003x0.060-0.065	2	5.1	

Note 1: FCC plugs and receptacles with and without mounting ears are part of the AMP-UNYT connector series. Refer to the last column, "Remarks," for additional mating possibilities.
Note 2: Mated dimensions do not include locking and mounting screws and spring clips.
Note 3: Round wire AWG 24-22 may be used.
Note 4: Weights are approximate.

CHART III - 11. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
AMP (Con.)			Note 1			Note 2	Note 2		
Receptacle With Mounting Ears (Con.)									
1 1-86672-3	Crimp	Removable	Socket	Phosphor Bronze	For All Series: Gold (Available: 15, 30, Or 50) Over 30 Nickel	8200	1200	500	No Data
2 86672-9						9400	1400		
3 86672-1						9900	1500		
Receptacle Without Mounting Ears									
4 1-86673-1						2600	400		
5 86673-5						2800	400		
6 86673-3						5400	800		
7 86673-7						5700	900		
8 1-86673-3						8200	1200		
9 86673-9						9400	1400		
10 86673-1						9900	1500		
Receptacle With Mounting Ears									
11 86578-3	Crimp	Removable	Socket	Phosphor Bronze		5400	800	500	No Data

Note 1: Solder tab contacts for permanent printed circuit board terminations are also available.
Note 2: Mating force measurements are maximum, unmating force measurements are minimum.

CHART III - 11. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP (Con.)										
Receptacle With Mounting Ears (Con.)										
1 1-86672-3	0.30x3.66x0.60	For Both Series: Self- extinguishing Glass-filled Nylon	None	Terminated To Contact	Double Row In-line	Jackscrews Jackscrews Jackscrews	Screw Screw Screw	None	None	For All Series: Keying Plug Used In Any Socket
2 86672-9	0.30x4.16x0.60									
3 86672-1	0.30x4.26x0.60									
Receptacle Without Mounting Ears										
4 1-86673-1	0.30x1.15x0.60	0.30x3.15x0.60 0.30x1.25x0.60 0.30x2.15x0.60 0.30x2.24x0.60 0.30x3.15x0.60 0.30x3.55x0.60 0.30x3.75x0.60	None	None	None	None	None	None	None	
5 86673-5	0.30x1.25x0.60									
6 86673-3	0.30x2.15x0.60									
7 86673-7	0.30x2.24x0.60									
8 1-86673-3	0.30x3.15x0.60									
9 86673-9	0.30x3.55x0.60									
10 86673-1	0.30x3.75x0.60									
Receptacle With Mounting Ears										
11 86578-3	0.25x2.66x0.60	Diallylphthalate Per MIL-M- 14-F-STG	None	Terminated To Contact	Double Row In-line	Jackscrews	Screw	None	None	

CHART III - 11. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
AMP (Con.)			Note 1						
Receptacle With Mounting Ears (Con.)									
1 1-86672-3	None	-55 To +105	For All Series: FCC Hand Crimp- ing Tool #90236-1, FCC Auto. Crimping Machine #693790-2, Extraction Tools For Contacts #91048	None Required	None Required	For All Series: Military Uses, Computers And Related Equip- ment, Consumer Products	Stock	IPC-FC-218	Type Flat To Flat Connections: FCC To FCC, Flexible Circuit, PC Board, And Aluminum Panel. Receptacles can also be used for flat to round and round to round connections. Refer to "Connectors: Flat To Round." For all receptacles with and without mounting ears, round wire and FCC can be intermixed in any housing. Flexible circuits can be crimp terminated with the receptacles provided the termination pads are made to AMP specifications. FCC contacts can be crimped anywhere on a cable to allow daisy chain- ing. FCC must conform to IPC-FC-220, Tol. Class IV. Insulation material must be poly- ester or polyimide. Receptacles will mate with AMPMODU Mod. II, 0.025x0.025 posts for PC board applications.
2 86672-9									
3 86672-1									
Receptacle Without Mounting Ears									
4 1-86673-1									
5 86673-5									
6 86673-3									
7 86673-7									
8 1-86673-3									
9 86673-9									
10 86673-1		-55 To +105							
Receptacle With Mounting Ears									
11 86578-3	None	-55 To +150		None Required	None Required		Stock	IPC-FC-218	

Note 1: When round wire is used in the receptacles, the following tools are needed: Round Wire Hand Crimping Tool #90222-2, Auto, Crimping Machine for Contacts #687350-1, Extraction Tools for Contacts #91048.

CHART III - 12. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: H×W×D Or Dia×L (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Ansley	Note 1	IV-27	No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	7, 9, or 14	0.100, 0.075, Or 0.050	0.800	From 0.003×0.035 To 0.004×0.062	1	No Data
Receptacle, Mid Span Tap	(1) Printed Circuit Board Or (2) Rack And Panel Plug		No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	12, 16, or 24	Or 0.050 From Lowest To Highest In Each Group Of 3	1.300			
			No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	15, 20 or 30		1.600			
			No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	22, 29, or 44		2.300			
			No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	28, 37, or 56		2.900			
			No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	30, 40, or 60		3.100			
			No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	36, 48, or 72		3.700			
			No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	45, 60, or 91		4.630			
			No Data	Depends On FCC	5000/10 ft Cable	No Data	No Data	50, 67, or 100		5.100	From 0.003×0.035 To 0.004×0.062		
Matrix Receptacle For 0.100 Grid	(1) Matrix Plug For 0.100 Grid Or (2) Sq. Wire Wrap Pins On 0.100 Centers		300	1.1	5000/10 ft Cable	No Data	No Data	20	0.100	2.15	0.062×0.003	1	No Data
Belling And Lee Note 2													
Receptacle, Flexicon Connector Series, Vendor Number 11385	Plug, Flexicon Connector Series, Vendor Number 11385		This connector series has been designed for FCC to FCC, FCC to pc board, and FCC to round wire connections. For available information on the series in general, refer to "Connectors: Flat To Flat, Plugs."										

Note 1: The rack and panel plug which mates with the receptacle is similar to the rack and panel plug described in the charts entitled, "Connectors: Flat To Round."

Obtain plug data directly from Ansley.

Note 2: Belling and Lee of Enfield, England is represented in the United States by The Ercona Corporation. The vendor number given is Ercona's.

CHART III - 12. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS										
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)	
1 Ansley Receptacle, Mid Span Tap	For Part Series: Contacts Formed From Cable Conductors	Fixed	For Series: Formed From Cable Conduc- tors, Spring Loaded (Mechanical Pressure Only)	Depends On FCC Type	Depends On FCC Type	No Data	No Data	No Data	No Data	
2										
3										
4										
5										
6										
7										
8										
9										
10 Matrix Receptacle For 0.100 Grid	Solder Or Weld	Fixed	Socket	Depends On FCC Type No Data	Depends On FCC Type No Data	No Data	No Data	No Data	No Data	
11 Belling And Lee Receptacle, Flexicon Connector Series Vendor No. 11385										
This connector series has been designed for FCC to FCC, FCC to pc board, and FCC to round wire connections. For available information on the series in general, refer to "Connectors: Flat To Flat, Plugs."										

CHART III - 12. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
1 Ansley Receptacle, Mid Span Tap	0.62x2.00x0.50	Polycarbonate Resin	None	None	One Row	Screw	Screw	None	None Required	None
2	0.62x2.50x0.50									
3	0.62x2.80x0.50									
4	0.62x3.50x0.50									
5	0.62x4.10x0.50									
6	0.62x4.30x0.50									
7	0.62x4.90x0.50									
8	0.62x5.83x0.50									
9	0.62x6.30x0.50									
10 Matrix Receptacle For 0.100 Grid	No Data	Nylon Fiberfil J2/30	None	None	One Row	None	None	No Data	None Required	None
Belling And Lee										
11 Receptacle, Flexicon Connector Series Vendor No. 11385		This connector series has been designed for FCC to FCC, FCC to pc board, and FCC to round wire connections. For available information on the series in general, refer to "Connectors: Flat To Flat, Plugs."								

CHART III - 12. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1 Ansley Receptacle, Mid Span Tap	None	85 Max	None	Mechanical	Gold Over Nickel	No Data	Stock	No Data	Type Connections: FCC To FCC (Mid Span) Or To Printed Circuit Board
2									
3									
4									
5									
6									
7									
8									
9		85 Max	None		Gold Over Nickel			No Data	
10 Matrix Receptacle For 0.100 Grid	None	100 Max	Available As Assembled Or Would Require Heat forming Fixture For Cable Strain Relief	Mechanical	Tin If Conductors Are Soldered	No Data	Stock	IPC-FC-220, IPC-FC-218A, In-House Assembly "G" Drawings: C-8375, C-8379, E-8381	Type Connections: FCC To FCC Or FCC To Square Wire Wrap Pins. (Typical Example: FCC To Back Panel)
11 Belling And Lee Receptacle, Flexicon Connector Series Vendor No. 11385			This connector series has been designed for FCC to FCC, FCC to pc board, and FCC to round wire connections. For available information on the series in general, refer to "Connectors: Flat To Flat, Plugs."						

CHART III - 13. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: H×W×D Or Dia×L (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Berg	Note 1	Note 1	Note 2	Note 2	Note 2	Note 2	Note 2	Note 3	Note 3	Note 3	Note 3	Note 3	Note 3
1 Receptacle, Universal Series	Plug, Universal Series		300	1	5000	15	2.1×0.2×1.4	17	0.050	1.0	0.002×0.025	1	No Data
2			300				2.1×0.2×2.4	37	0.050	2.0	0.002×0.025		
3			300				2.1×0.2×3.4	57	0.050	3.0	0.002×0.025		
4 Receptacle, Universal Series	Plug, Universal Series		600				2.1×0.2×1.4	12	0.075	1.0	0.003×0.026		
5							2.1×0.2×2.4	25	0.075	2.0	0.003×0.026		
6				1			2.1×0.2×3.4	38	0.075	3.0	0.003×0.026		
7 Receptacle, Universal Series	Plug, Universal Series			3			2.1×0.2×1.4	9	0.100	1.0	0.003×0.062		
8				3			2.1×0.2×2.4	19	0.100	2.0	0.003×0.062		
9			600	3	5000	15	2.1×0.2×3.4	29	0.100	3.0	0.003×0.062	1	No Data
ITT Cannon	Note 4	IV-53	Note 4	Note 4	Note 4	Note 4	Note 4	Note 5	Note 6	Note 7	Note 7	Note 7	Note 7
10 Receptacle, Flat Backshell	Plug, Flat Backshell												
11 FC*3B*****	FC*1B*****		600	3	5000	No Data	0.71×1.45×2.24	7, 6, or 4	For Each Receptacle In The Series:	0.5	0.005×0.025 For 0.050 Contact Spacing, 0.005	1, 2, or 3	No Data
12 FC*3C*****	FC*1C*****						0.71×1.90×2.24	17, 12, or 9		1.0	×0.040 For 0.075, And 0.006×0.065 For 0.100		
13 FC*3D*****	FC*1D*****						0.71×2.40×2.24	27, 18, or 14		1.5			
14 FC*3E*****	FC*1E*****						0.71×2.90×2.24	37, 25, or 19		2.0			
15 FC*3F*****	FC*1F*****						0.71×3.40×2.24	47, 32, or 24		2.5			
FC*3G*****	FC*1G*****		600	3	5000	No Data	0.71×3.90×2.24	57, 38, or 29	0.075, Or 0.100 (For Min Contact No. Per Layer)	3.0		1, 2, or 3	No Data

(Continued)

Note 1: These FCC plugs and receptacles are in development. The in-house name applied to them, as well as to developmental FCC transitions, is "Universal Connectors."

Note 2: In process testing.

Note 3: Round wire 32, 30, and 26 AWG can also be used in place of the flat conductor sizes 0.002×0.025, 0.003×0.026, and 0.003×0.062.

Note 4: The asterisks within part numbers indicate variable characteristics. A complete part number explanation can be found in the section entitled "Manufacturers' Data." For information on additional mating possibilities, refer to the last column, "Remarks."

Note 5: Depth Measurements are maximum.

Note 6: Number of contacts by cable layer.

Note 7: Round wire 24-30 AWG can be used.

CHART III - 13. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
Berg	Force-fit	Fixed	Bifurcated Socket	Beryllium Copper	For All Series: 50 Gold Over Nickel Flash	1700	1700	500	125
1 Receptacle, Universal Series									
2						3700	3700		
3						5700	5700		
4 Receptacle, Universal Series						1200	1200		
5						2500	2500		
6						3800	3800		
7 Receptacle, Universal Series	Force-fit	Fixed	Bifurcated Socket	Beryllium Copper		900	900	500	125
8						1900	1900		
9						2900	2900		
ITT Cannon	Note 1					Note 2	Note 2		
Receptacle, Flat Backshell	Weld Or Solder	For Series: Removable Wafer With Fixed Contacts	Pin or Socket	No Data	50 Gold Minimum	Shell: 2700	Shell: 900	500	127
10 FC* 3B* * * * *						Shell: 3600	Shell: 1800		
11 FC* 3C* * * * *						Shell: 4500	Shell: 2700		
12 FC* 3D* * * * *						Shell: 5400	Shell: 3600		
13 FC* 3E* * * * *						Shell: 6400	Shell: 4500		
14 FC* 3F* * * * *						Shell: 7300	Shell: 5400		
15 FC* 3G* * * * *	Weld Or Solder		Pin or Socket	No Data	50 Gold Minimum			500	127
(Continued)									

Note 1: If round wire is used, termination is by crimping.

Note 2: Add 230 grams per contact for total mating force, 170 grams per contact for total unmating force.

CHART III - 13. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY												
Identification: Manufacturer And Part		Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying	
Berg												
1	Receptacle, Universal Series	0.2x1.4x1.14	For All Series: Molded, Mate- rial Data Not Available	None	None	In-line	Screw	Screw	For All Series: Provided by Housing	None	Polarized	
2		0.2x2.4x1.14										
3		0.2x3.4x1.14										
4	Receptacle, Universal Series	0.2x1.4x1.14										
5		0.2x2.4x1.14										
6		0.2x3.4x1.14										
7	Receptacle, Universal Series	0.2x1.4x1.14										
8		0.2x2.4x1.14										
9		0.2x3.4x1.14			None	None	In-line	Screw	Screw		None	Polarized
ITT Cannon												
Receptacle, Flat Backshell												
10	FC*3B*****	0.71 0.69x1.45x1.36 Max	Aluminum Alloy	Cadmium Plate	For Series: Operational Bars For Flat Cable Backshell	1, 2, Or 3 Rows In-line	Jackscrews	Jackscrews, Side Mount Blocks	None	Yes	For Series: Wafers Are Posi- tioned And Polar- ized, Shell Has Key Clips For 9 Positions. FC*3C***** And FC*3F***** Are Also Avail- able With Revers- ible Wafer Assemblies.	
11	FC*3C*****	0.71 0.69x1.90x1.36 Max										
12	FC*3D*****	0.71 0.69x2.40x1.36 Max										
13	FC*3E*****	0.71 0.69x2.90x1.36 Max	Aluminum Alloy	Cadmium Plate								
14	FC*3F*****	0.71 0.69x3.40x1.36 Max										
15	FC*3G*****	0.71 0.69x3.90x1.36 Max		Cadmium Plate		1, 2, Or 3 Rows In-line	Jackscrews	Jackscrews, Side Mount Blocks	None	Yes		
(Continued)												

CHART III - 13. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
Berg									
1	For All Series: En- capsulated, See Housing Material	-60 To +150	None	Mechanical	For All Series: 0.00005 In. Gold Per MIL-C-45204 Type II	Commercial Uses	Expected Pro- duction Date For All Series: 1971	MIL-C-55544	Type Flat To Flat Connec- tions For Universal Recep- tacles: FCC To FCC. As round wire can also be used in these parts, flat to round and round to also possible.
2									
3									
4									
5									
6									
7									
8									
9		-60 To +150	None	Mechanical		Commercial Uses		MIL-C-55544	
ITT Cannon									
Receptacle, Flat Backshell									
10	For Series: Interfacial and Periph- eral, Envi- ronmental, Silicone Rubber	No Data	No Data	No Data	No Data	Military: Missiles	Not Toolled Tooled	MIL-C-55544	Type Flat To Flat Connec- tions: FCC To FCC. Receptacles also mate with plugs FC#1 and FC#2 for flat to round and round to round connections. The removable wafer concept used by ITT Cannon allows for intermixing of round wire and FCC in any housing.
11									
12									
13									
14									
15		No Data	No Data	No Data	No Data	Military: Missiles	Not Toolled	MIL-C-55544	
(Continued)									

CHART III - 14. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: H×W×D Or Dia×L (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
ITT Cannon (Con.) Note 1	Note 1	IV-53						Note 2	Note 3	Note 4		Note 5	
<u>Receptacle, Box Mounted Backshell</u>	<u>Plug, Flat Backshell</u>												
1 FC*5B*****	FC*1B*****		600	3	5000	No Data	0.71 0.69	7, 6, Or 4	For Series: 0.050, 0.075, 0.100	0.5	0.005×0.025 With 0.050 Contact Spacing, 0.005 ×0.040 With 0.075, And 0.006 × 0.065 With 0.100	1, 2, Or 3	No Data
2 FC*5C*****	FC*1C*****						0.71×1.90×2.04 0.69	17, 12, Or 9		1.0			
3 FC*5D*****	FC*1D*****						0.71×2.40×2.04 0.69	27, 18, Or 14		1.5			
4 FC*5E*****	FC*1E*****						0.71×2.90×2.04 0.69	37, 25, Or 19		2.0			
5 FC*5F*****	FC*1F*****						0.71×3.40×2.04 0.69	47, 32, Or 24		2.5			
6 FC*5G*****	FC*1G*****		600		5000		0.71×3.90×2.04 0.69	57, 38, Or 29		3.0			
<u>Receptacle, Box Mounted Backshell, Pressure Sealed</u>	<u>Plug, Flat Backshell</u>												
7 FC*6B*****	FC*1B*****		No Data		No Data		0.71 0.69	7, 6, Or 4	For Series: 0.050, 0.075, 0.100	0.5	0.005×0.025 With 0.050 Contact Spacing, 0.005 ×0.040 With 0.075, And 0.006 ×0.065 With 0.100	1, 2, Or 3	No Data
8 FC*6C*****	FC*1C*****						0.71×1.90×2.04 0.69	17, 12, Or 9		1.0			
9 FC*6D*****	FC*1D*****						0.71×2.40×2.04 0.69	27, 18, Or 14		1.5			
10 FC*6E*****	FC*1E*****						0.71×2.90×2.04 0.69	37, 25, Or 19		2.0			
11 FC*6F*****	FC*1F*****						0.71×3.40×2.04 0.69	47, 32, Or 24		2.5			
12 FC*6G*****	FC*1G*****		No Data	3	No Data	No Data	0.71×3.90×2.04 0.69	57, 38, Or 29		3.0			No Data

Note 1: The asterisks within part numbers indicate variable characteristics. A complete part number explanation can be found in the section entitled "Manufacturers' Data." For additional mating possibilities, refer to the last column, "Remarks."

Note 2: Depth measurements are maximum.
Note 3: Number of contacts by cable layer.
Note 4: For each group of three contact numbers, 0.050 is the center-to-center contact spacing for the maximum contact number, 0.100 for the minimum.
Note 5: Round wire 24-30 AWG can be used.

CHART III - 14. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
ITT Cannon (Con.)	Note 1					Note 2	Note 2		
Receptacle, Box Mounted Backshell									
1 FC*5B*****	Weld Or Solder	For All Series: Removable Wafer With Fixed Contacts	Pin Or Socket	No Data	50 Gold Minimum	Shell: 2700	Shell: 900	500	127
2 FC*5C*****						Shell: 3600	Shell: 1800		
3 FC*5D*****						Shell: 4500	Shell: 2700		
4 FC*5E*****						Shell: 5400	Shell: 3600		
5 FC*5F*****						Shell: 6400	Shell: 4500		
6 FC*5G*****						Shell: 7300	Shell: 5400		
Receptacle, Box Mounted Backshell, Pressure Sealed									
7 FC*6B*****	Weld Or Solder				50 Gold Minimum	Shell: 2700	Shell: 900	500	127
8 FC*6C*****						Shell: 3600	Shell: 1800		
9 FC*6D*****						Shell: 4500	Shell: 2700		
10 FC*6E*****						Shell: 5400	Shell: 3600		
11 FC*6F*****						Shell: 6400	Shell: 4500		
12 FC*6G*****						Shell: 7300	Shell: 5400		

Note 1: If round wire is used for flat to round or round to round connection, termination is by crimping.
Note 2: Add 230 grams per contact for total mating force, 170 grams per contact for total unmating force.

CHART III - 14. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
ITT Cannon (Con.)										
Receptacle, Box Mounted Backshell										
1 FC*5B*****	0.71 0.69 x1.45x1.16 Max	Aluminum Alloy	Cadmium Plate	For All Series: Optional Bars For Flat Cable Backshell	1, 2, Or 3 Rows In-line	Jackscrews	For All Series: Jackscrews, Side Mount Blocks	None	Yes	For All Series: Wafers Are Positioned And Polarized, Shell Has Key Clips For 9 Positions
2 FC*5C*****	0.71 0.69 x1.90x1.16 Max									
3 FC*5D*****	0.71 0.69 x2.40x1.16 Max									
4 FC*5E*****	0.71 0.69 x2.90x1.16 Max									
5 FC*5F*****	0.71 0.69 x3.40x1.16 Max									
6 FC*5G*****	0.71 0.69 x3.90x1.16 Max									
Receptacle, Box Mounted Backshell, Pressure Sealed										
7 FC*6B*****	0.71 0.69 x1.45x1.16 Max									
8 FC*6C*****	0.71 0.69 x1.90x1.16 Max									
9 FC*6D*****	0.71 0.69 x2.40x1.16 Max									
10 FC*6E*****	0.71 0.69 x2.90x1.16 Max									
11 FC*6F*****	0.71 0.69 x3.40x1.16 Max									
12 FC*6G*****	0.71 0.69 x3.90x1.16 Max	Aluminum Alloy	Cadmium Plate		1, 2, Or 3 Rows In-line	Jackscrews		None	Yes	

CHART III - 14. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
ITT Cannon (Con.)									
Receptacle, Box Mounted Backshell									
1 FC*5B*****	For All Series: Interfacial And Peripheral, Environ- mental, Silicone Rubber	No Data	No Data	No Data	No Data	Military: Missiles	Not Tooled	MIL-C-55544	Type flat to Flat Connec- tions: FCC To FCC. Receptacles also mate with plugs FC*1 and FC*2 for flat to round and round to round connec- tions. The removable wafer concept used by ITT Cannon allows for intermixing of round wire and FCC in any housing.
2 FC*5C*****									
3 FC*5D*****									
4 FC*5E*****									
5 FC*5F*****									
6 FC*5G*****									
Receptacle, Box Mounted Backshell Pressure Sealed									
7 FC*6B*****									
8 FC*6C*****									
9 FC*6D*****									
10 FC*6E*****									
11 FC*6F*****									
12 FC*6G*****									

CHART III - 15. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Kings	Note 1	Notes 1, 2					Note 3					
	IV-67											
	Jack Receptacle	Plug										
1	F3510-170-00	F5510-170-00	750	2	No Data	20	$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$	0.050	1.000	0.0025x0.025	1	30
2	F3510-171-00	F5510-171-00					$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$		1.000			30
3	F3510-171-00	F5510-171-00					$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$		1.250			35
4	F3510-220-00	F5510-220-00					$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$		1.250			35
5	F3510-221-00	F5510-221-00					$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$		1.500			40
6	F3510-270-00	F5510-270-00					$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$		1.500			40
7	F3510-271-00	F5510-271-00					$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$		1.750			45
8	F3510-320-00	F5510-320-00				20	$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$		1.750			45
	F3510-321-00	F5510-321-00					$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$		1.750			
	Printed Circuit Receptacle	Printed Circuit Board										
9	F7550-170-00					15	Not Applicable		1.000			30
10	F7550-171-00								1.000			30
11	F7550-220-00								1.250			35
12	F7550-221-00								1.250			35
13	F7550-270-00								1.500			40
14	F7550-271-00								1.500			40
15	F7550-320-00		750	2	No Data	15	Not Applicable	0.050	1.750	0.0025x0.025	1	45
16	F7550-321-00								1.750			45
(Continued)												

Note 1: Refer to last column, "Remarks," for information on additional mating possibilities.

Note 2: Plug Pairs differ in FCC insulation thickness.

Note 3: Members of each plug pair per receptacle have the same dimensions.

CHART III - 15. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (min.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
<u>Kings</u>									
<u>Jack Receptacle</u>									
1 F3510-170-00	Insulation Piercing	Removable	Socket	Beryllium Copper	50 Gold	No Data	No Data	250	No Data
2 F3510-171-00									
3 F3510-220-00									
4 F3510-221-00									
5 F3510-270-00									
6 F3510-271-00									
7 F3510-320-00									
8 F3510-321-00									
<u>Printed Circuit Receptacle</u>									
9 F7550-170-00	Insulation Piercing	Removable	PC Board Sliding Contact	Beryllium Copper	50 Gold	No Data	No Data	100	No Data
10 F7550-171-00									
11 F7550-220-00									
12 F7550-221-00									
13 F7550-270-00									
14 F7550-271-00									
15 F7550-320-00									
16 F7550-321-00									
(Continued)									

CHART III - 15. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Kings	Note 1									
Jack Receptacle										
1 F3510-170-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Offset ← → Offset
2 F3510-171-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
3 F3510-220-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
4 F3510-221-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
5 F3510-270-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
6 F3510-271-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
7 F3510-320-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
8 F3510-321-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
Printed Circuit Receptacle										
9 F7550-170-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Polarized Screw ← → Polarized Screw
10 F7550-171-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
11 F7550-220-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
12 F7550-221-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
13 F7550-270-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
14 F7550-271-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
15 F7550-320-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
16 F7550-321-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
(Continued)										

Note 1: Depth measurement does not include lock guide screws.

CHART III - 15. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
Kings									
Jack Receptacle									
1 F3510-170-00	For Series: Gasket, Environ- mental, Silicone Rubber	-55 To +180	None	None Required	None	Military And Commercial Uses For All Series: Computers, Com- munications, Data Processing Equip- ment, Office Equipment Includ- ing Copiers, Aircraft	1 Year Production 1 Year Production	All Series Are Designed To Applicable Military Specifi- cations. Not Qualified At This Time.	Type Flat To Flat Connections: FCC To FCC. Receptacles also mate with additional plugs for flat to round connec- tions. 0.012 in. cable thickness for parts F3510-170-00, -220-, -270-, and -320-; 0.016 in. cable thickness for parts F3510-171-00, -221-, -271-, and -321-.
2 F3510-171-00									
3 F3510-220-00									
4 F3510-221-00									
5 F3510-270-00									
6 F3510-271-00									
7 F3510-320-00									
8 F3510-321-00									
Printed Circuit Receptacle									
9 F7550-170-00	None	-55 To +160	None	None Required	None		No Schedule No Schedule In Production In Production No Schedule No Schedule In Production In Production	Type Connections: FCC To PC Board. 0.062 in. board thickness for all parts; 0.012 in. cable thickness for parts F7550-170-00, -220-, -270-, and -320-; 0.016 in. cable thickness for parts F7550-171-00, -221-, -271-, and -321-.	
10 F7550-171-00									
11 F7550-220-00									
12 F7550-221-00									
13 F7550-270-00									
14 F7550-271-00									
15 F7550-320-00									
16 F7550-321-00									
(Continued)									

CHART III - 16. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
		Kings (Con.)	IV-67										
		Printed Circuit Receptacle (Con.)	Printed Circuit Board										
1	F7560-340-00		750	2	No Data	15	Not Applicable	34	0.050	1.000	0.0025x0.025	2	30
2	F7560-341-00							34		1.000			30
3	F7560-440-00							44		1.250			35
4	F7560-441-00							44		1.250			35
5	F7560-540-00							54		1.500			40
6	F7560-541-00							54		1.500			40
7	F7560-640-00							64		1.750			45
8	F7560-641-00		750	2	No Data	15	Not Applicable	64	0.050	1.750	0.0025x0.025	2	45
		Methods Note 1											
		Receptacle	Printed Circuit Board										
9	70-&71-6006-1100		600	5	5000 Min	6 Max	Not Applicable	6	0.156	1.0	0.003x0.078	1	No Data
10	70-&71-6008-1100							8		1.3			
11	70-&71-6010-1100							10		1.6			
12	70-&71-6012-1100							12		2.0			
13	70-&71-6015-1100							15		2.4			
14	70-&71-6018-1100							18		2.9			
15	70-&71-6022-1100							22		3.5			
16	70-&71-6024-1100		600	5	5000 Min	6 Max	Not Applicable	24	0.156	3.8	0.003x0.078	1	No Data
		(Continued)											

Note 1: Components can also be obtained in component and FCC assemblies to meet standard and special requirements.

CHART III - 16. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
Kings (Con.)									
Printed Circuit Receptacle (Con.)									
1	Insulation Piercing	Removable	PC Board Sliding Contact	Beryllium Copper	50 Gold	No Data	No Data	100	No Data
2						No Data	No Data		
3	Insulation Piercing	Removable	PC Board Sliding Contact	Beryllium Copper	50 Gold	3700	2000	100	No Data
4						3700	2000		
5	Insulation Piercing	Removable	PC Board Sliding Contact	Beryllium Copper	50 Gold	No Data	No Data	100	No Data
6						No Data	No Data		
7	Insulation Piercing	Removable	PC Board Sliding Contact	Beryllium Copper	50 Gold	5100	2300	100	No Data
8						5100	2300		
Methode									
Receptacle									
9	Solder	Fixed	For 70 Series: Dual Fulcrum Or Bellows. For 71 Series: Cantilever Or Bellows	Beryllium Copper	For 70 Series: 50 Gold Over Copper. For 71 Series: 20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
10						No Data	No Data		
11	Solder	Fixed	For 70 Series: Dual Fulcrum Or Bellows. For 71 Series: Cantilever Or Bellows	Beryllium Copper	For 70 Series: 50 Gold Over Copper. For 71 Series: 20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
12						No Data	No Data		
13	Solder	Fixed	For 70 Series: Dual Fulcrum Or Bellows. For 71 Series: Cantilever Or Bellows	Beryllium Copper	For 70 Series: 50 Gold Over Copper. For 71 Series: 20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
14						No Data	No Data		
15	Solder	Fixed	For 70 Series: Dual Fulcrum Or Bellows. For 71 Series: Cantilever Or Bellows	Beryllium Copper	For 70 Series: 50 Gold Over Copper. For 71 Series: 20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
16						No Data	No Data		
(Continued)									

Note 1: Mating and unmating forces given are approximate.

Note 2: Other platings are available upon request.

CHART III - 16. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Kings (Con.)	Note 1									
Printed Circuit Receptacle (Con.)										
1 F7560-340-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$	Glass Phenolic	None	None	Dual In-line	Screws	Screws	Clamp Plate	None	Polarized Screw
2 F7560-341-00	$\frac{5}{16} \times \frac{1}{2} \times \frac{3}{4}$									
3 F7560-440-00	$\frac{5}{16} \times \frac{5}{8} \times \frac{3}{4}$									
4 F7560-441-00	$\frac{5}{16} \times \frac{5}{8} \times \frac{3}{4}$									
5 F7560-540-00	$\frac{5}{16} \times \frac{9}{16} \times \frac{3}{4}$	Glass Phenolic	None	None	Dual In-line	Screws	Screws	Clamp Plate	None	Polarized Screw
6 F7560-541-00	$\frac{5}{16} \times \frac{9}{16} \times \frac{3}{4}$									
7 F7560-640-00	$\frac{5}{16} \times \frac{13}{16} \times \frac{3}{4}$									
8 F7560-641-00	$\frac{5}{16} \times \frac{13}{16} \times \frac{3}{4}$									
Methods										
Receptacle										
9 70-&71-6006-1100	0.34x1.8x0.47	Diallylphthalate	None	None	One Row	None	Screws	None	Yes, Polyimide Resin	For All Parts: In Contact Or Between Contact Position
10 70-&71-6008-1100	0.34x2.1x0.47									
11 70-&71-6010-1100	0.34x2.4x0.47									
12 70-&71-6012-1100	0.34x2.7x0.47									
13 70-&71-6015-1100	0.34x3.2x0.47	Diallylphthalate	None	None	One Row	None	Screws	None	Yes, Polyimide Resin	For All Parts: In Contact Or Between Contact Position
14 70-&71-6018-1100	0.34x3.7x0.47									
15 70-&71-6022-1100	0.34x4.3x0.47									
16 70-&71-6024-1100	0.34x4.6x0.47									
(Continued)										

Note 1: Depth measurement does not include screws.

CHART III - 16. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
Kings (Con.)									
Printed Circuit Receptacle (Con.)									
1 F7560-340-00	None	-55 To +160	None	None Required	None	Military And Commercial Uses For Series: Computers, Com- munications, Com- Data Processing Equipment, Office Equipment Including Copiers, Aircraft	No Schedule No Schedule In Production In Production No Schedule No Schedule In Production In Production	Series Is Designed To Applicable Specifications. Not Qualified At This Time.	Type Connections: FCC To PC Board. 0.062 in. board thickness for all parts; 0.012 in. cable thickness for parts F7560-340-00, -440-, -540-, and -640-; 0.016 in. cable thickness for parts F7560-341-00, -441-, -541-, and -641-.
2 F7560-341-00									
3 F7560-440-00									
4 F7560-441-00									
5 F7560-540-00									
6 F7560-541-00									
7 F7560-640-00									
8 F7560-641-00	None	-55 To +160	None	None Required	None				
Methode									
Receptacle									
9 70-&71-6006-1100	None	For 70 Series: -65 To +150; For 71 Series: -55 To +85	None	Mechanical	Tin	For All Parts: Military, Aerospace, Communication	3 To 5 Weeks	For 70 And 71 Series: IPC-PC-21811, For 70 Series Only: MIL-C-21097	Type Connections: FCC To 0.054-0.070 in. PC Board.
10 70-&71-6008-1100									
11 70-&71-6010-1100									
12 70-&71-6012-1100									
13 70-&71-6015-1100									
14 70-&71-6018-1100									
15 70-&71-6022-1100									
16 70-&71-6024-1100	None		None	Mechanical	Tin		3 To 5 Weeks		
(Continued)									

CHART III - 17. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufac-turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Method (Con.)	Note 1												
Receptacle	Plug												
1 90-&91-6006-1200	60-6006-1100		600	5	5000 Min	6 Max	0.34x1.8x0.94	6	0.156	1.0	0.003x0.078	1	No Data
2 90-&91-6008-1200	60-6008-1100						0.34x2.1x0.94	8		1.3			
3 90-&91-6010-1200	60-6010-1100						0.34x2.4x0.94	10		1.6			
4 90-&91-6012-1200	60-6012-1100						0.34x2.7x0.94	12		2.0			
5 90-&91-6015-1200	60-6015-1100						0.34x3.2x0.94	15		2.4			
6 90-&91-6018-1200	60-6018-1100						0.34x3.7x0.94	18		2.9			
7 90-&91-6022-1200	60-6022-1100						0.34x4.3x0.94	22		3.5			
8 90-&91-6024-1200	60-6024-1100						0.34x4.6x0.94	24		3.8		1	
Receptacle	Printed Circuit Board												
9 80-&81-6012-1100							Not Applicable	12		1.0		2	
10 80-&81-6016-1100								16		1.3			
11 80-&81-6020-1100								20		1.6			
12 80-&81-6024-1100								24		2.0			
13 80-&81-6030-1100								30		2.4			
14 80-&81-6036-1100								36		2.9			
15 80-&81-6044-1100								44		3.5			
16 80-&81-6048-1100			600	5	5000 Min	6 Max	Not Applicable	48	0.156	3.8	0.003x0.078	2	No Data
(Continued)													

Note 1: Components can also be obtained in component and FCC assemblies to meet standard and special requirements.

CHART III - 17. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS										
Identification: Manufacturer And Part		Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
Methode (Con.)						Note 1				
Receptacle										
1	90-&91-6006-1200	Solder	Fixed	Tuning Fork	Phosphor Bronze	For 90 Series: 50 Gold Over Copper. For 91 Series: 20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
2	90-&91-6008-1200									
3	90-&91-6010-1200									
4	90-&91-6012-1200									
5	90-&91-6015-1200									
6	90-&91-6018-1200									
7	90-&91-6022-1200									
8	90-&91-6024-1200			Tuning Fork	Phosphor Bronze					
Receptacle										
9	80-&81-6012-1100			For 80 Series: Dual Fulcrum Or Bellows. For 81 Series: Cantilever Or Bellows	Beryllium Copper	For 80 Series: 50 Gold Over Copper. For 81 Series: 20 Gold Over Copper	No Data	No Data	500	Per Mil-C-21097
10	80-&81-6016-1100									
11	80-&81-6020-1100									
12	80-&81-6024-1100									
13	80-&81-6030-1100									
14	80-&81-6036-1100									
15	80-&81-6044-1100									
16	80-&81-6048-1100	Solder	Fixed		Beryllium Copper		No Data	No Data	500	Per Mil-C-21097
(Continued)										

Note 1: Other platings are available upon request.

CHART III - 17. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: Hx WxD Or, DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Methode (Con.)										
Receptacle										
1 90-&91-6006-1200	0.34x1.8x0.47	Diallylphthalate	None	None	One Row	None	Screw	None	Yes, Polyimide Resin	For All Parts: In Contact Or Between Contact Position
2 90-&91-6008-1200	0.34x2.1x0.47									
3 90-&81-6010-1200	0.34x2.4x0.47									
4 90-&91-6012-1200	0.34x2.7x0.47									
5 90-&81-6015-1200	0.34x3.2x0.47									
6 90-&91-6018-1200	0.34x3.7x0.47									
7 90-&91-6022-1200	0.34x4.3x0.47									
8 90-&91-6024-1200	0.34x4.6x0.47									
Receptacle										
9 80-&81-6012-1100	0.34x1.8x0.47	Diallylphthalate	None	None	Dual Row In-line	None	Screw	None	Yes, Polyimide Resin	For All Parts: In Contact Or Between Contact Position
10 80-&81-6016-1100	0.34x2.1x0.47									
11 80-&81-6020-1100	0.34x2.4x0.47									
12 80-&81-6024-1100	0.34x2.7x0.47									
13 80-&81-6030-1100	0.34x3.2x0.47									
14 80-&81-6036-1100	0.34x3.7x0.47									
15 80-&81-6044-1100	0.34x4.3x0.47									
16 80-&81-6048-1100	0.34x4.6x0.47									
(Continued)										

CHART III - 17. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
Methode (Con.)									
Receptacle									
1 90-&91-6006-1200	None	-65 To +150	None	Mechanical	Tin	For All Parts: Military, Aerospace, Communications	3 To 5 Weeks	For 90 And 91 Series: IPC-FC- 218/9. For 90 Series Only: MIL-C-21097	Type Connections: FCC To FCC And FCC To 0.054-0.070 in. Printed Circuit Board.
2 90-&91-6008-1200									
3 90-&91-6010-1200									
4 90-&91-6012-1200									
5 90-&91-6015-1200									
6 90-&91-6018-1200									
7 90-&91-6022-1200									
8 90-&91-6024-1200									
Receptacle									
9 80-&81-6012-1100	None	For 80 Series: -65 To +150. For 81 Series: -55 To +85.	None	Mechanical	Tin	For All Parts: Military, Aerospace, Communications	3 To 5 Weeks	For 80 And 81 Series: IPC-FC- 218/8. For 80 Series Only: MIL-C-21097	Type Connections: FCC To 0.054-0.070 Printed Circuit Board.
10 80-&81-6016-1100									
11 80-&81-6020-1100									
12 80-&81-6024-1100									
13 80-&81-6030-1100									
14 80-&81-6036-1100									
15 80-&81-6044-1100									
16 80-&81-6048-1100									
(Continued)									

CHART III - 18. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION				ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
Methode (Con.) Notes 1, 2		Note 2											
<u>Receptacle</u>		<u>Plug</u>											
1 94-6112-1200	63-6212-1100		600	5	5000 Min	6 Max	1.0×2.7×0.94	12	0.156	1.0	0.003×0.078	2	No Data
2 94-6116-1200	63-6216-1100						1.0×3.0×0.94	16		1.3			
3 94-6120-1200	63-6220-1100						1.0×3.3×0.94	20		1.6			
4 94-6124-1200	63-6224-1100						1.0×3.6×0.94	24		2.0			
5 94-6130-1200	63-6230-1100						1.0×4.1×0.94	30		2.4			
6 94-6136-1200	63-6236-1100						1.0×4.6×0.94	36		2.9			
7 94-6144-1200	63-6244-1100						1.0×5.2×0.94	44		3.5			
8 94-6148-1200	63-6248-1100		600	5	5000 Min	6 Max	1.0×5.5×0.94	48	0.156	3.8	0.003×0.078	2	No Data
Microdot Note 3		Note 3											
<u>Receptacle, "Flexmate" Series</u>		<u>Plug, "Flexmate" Series</u>											
9 MCD(**) -9S(****)	MCD(**) -9P(****)		750	3	5000	10	0.2×0.78×1.125	9	0.050	0.30	0.003×0.025	2	2.54
10 MCD(**) -15S(****)	MCD(**) -15P(****)						0.2×0.9×1.125	15		0.50		2	3.17
11 MCD(**) -21S(****)	MCD(**) -21P(****)						0.2×1.08×1.125	21		0.70		2	5.92
12 MCD(**) -25S(****)	MCD(**) -25P(****)						0.2×1.18.1.125	25		0.80		2	6.61
13 MCD(**) -31S(****)	MCD(**) -31P(****)						0.2×1.33×1.125	31		0.95		2	7.50
14 MCD(**) -37S(****)	MCD(**) -37P(****)						0.2×1.48×1.125	37		1.10		2	8.39
15 MCD(**) -51S(****)	MCD(**) -51P(****)		750	3	5000	10	0.2×1.43×1.125	51	0.050	1.05	0.003×0.025	3	9.05

Note 1: Receptacles in the 94 series consist of two 91 series receptacles commonly mounted.

Note 2: Components can also be obtained in component and FCC assemblies to meet standard and special requirements.

Note 3: The asterisks within part numbers indicate variable characteristics. See "Manufacturers' Data" for an explanation of part nomenclature. For information on additional mating possibilities, refer to the last chart column, "Remarks."

CHART III - 18. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (min.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
<u>Method (Con.)</u>					Note 1				
<u>Receptacle</u>									
1 94-6112-1200	Solder	Fixed	Tuning Fork	Phosphor Bronze	20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
2 94-6116-1200									
3 94-6120-1200									
4 94-6124-1200									
5 94-6130-1200									
6 94-6136-1200									
7 94-6144-1200									
8 94-6148-1200	Solder	Fixed	Tuning Fork	Phosphor Bronze	20 Gold Over Copper	No Data	No Data	500	Per MIL-C-21097
<u>Microdot</u>									
<u>Receptacle, "Flexmate" Series</u>									
9 MCD(**) -9S(****)	Weld Or Solder	Removable Wafers With Fixed FCC	Socket ("Twist/Con")	Copper Alloy	100 Gold Over Copper Flash	1000	1000	500	No Data
10 MCD(**) -15S(****)						1700	1700		
11 MCD(**) -21S(****)						2400	2400		
12 MCD(**) -25S(****)						2800	2800		
13 MCD(**) -31S(****)						3500	3500		
14 MCD(**) -37S(****)						4200	4200		
15 MCD(**) -51S(****)	Weld Or Solder	Removable Wafers With Fixed FCC	Socket ("Twist/Con")	Copper Alloy	100 Gold Over Copper Flash	5800	5800	500	No Data

Note 1: Other platings are available upon request.

CHART III - 18. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Method (Con.)										
Receptacle										
1 94-6112-1200	1.0x2.7x0.47	Diallylphthalate	None	None	Dual Row In-line	None	Screw	None	Yes, Polyimide Resin	For Series: In Contact Or Between Contact Position
2 94-6116-1200	1.0x3.0x0.47									
3 94-6120-1200	1.0x3.3x0.47									
4 94-6124-1200	1.0x3.6x0.47									
5 94-6130-1200	1.0x4.1x0.47									
6 94-6136-1200	1.0x4.6x0.47									
7 94-6144-1200	1.0x5.2x0.47									
8 94-6148-1200	1.0x5.5x0.47									
Microdot										
Receptacle, "Flexmate" Series										
9 MCD(**) -9S(****)	0.2x0.78x0.65	For Series - Body Shell: Aluminum Alloy A-380, per QQ-A-591, Back Shell: Stainless Steel Type 304, Per QQ-S-766	For Series - Body Shell: Electroless Nickel Per MIL-C-28074 Class 3, Thickness 0.001/0.0015, Back Shell: Passivated Per MIL-F14072	To Contacts	2 Rows Staggered 2 Rows Staggered 2 Rows Staggered 2 Rows Staggered 2 Rows Staggered 3 Rows Staggered	Screws With Lock Wires	Available For Series: Screws Or Jackscrews	Back Shell	Yes, Epoxy (3M)	For Series: Keystone "D" Shape; Hex Inserts For 36 Positions
10 MCD(**) -15S(****)	0.2x0.9x0.65									
11 MCD(**) -21S(****)	0.2x1.08x0.65									
12 MCD(**) -25S(****)	0.2x1.18x0.65									
13 MCD(**) -31S(****)	0.2x1.33x0.65									
14 MCD(**) -37S(****)	0.2x1.48x0.65									
15 MCD(**) -51S(****)	0.2x1.43x0.65									

CHART III - 18. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
<u>Methods (Con.)</u>									
<u>Receptacle</u>									
1 94-6112-1200	None	-65 To +150	None	Mechanical	Tin	For All Parts: Military, Aerospace, Communications	3 To 5 Weeks	IPC-FC-218/10	Type Connections: FCC To FCC, FCC To 0.054- 0.070 Board
2 94-6116-1200									
3 94-6120-1200									
4 94-6124-1200									
5 94-6130-1200	None	-65 To +150	None	Mechanical	Tin		3 To 5 Weeks	IPC-FC-218/10	
6 94-6136-1200									
7 94-6144-1200									
8 94-6148-1200									
<u>Microdot</u>									
<u>Receptacle, "Flexmate" Series</u>									
9 MCD(**) -9S(****)	For Series: Interfacial Seal, Environ- mental, Silicone	-55 To +149	None	Mechanical	Optional	For Series: Aerospace and Commercial: Aircraft, Mis- siles, Computers	Special Order	MIL-C-55544	Type Flat To Flat Con- nections: FCC To FCC Within "Flexmate" Con- nector Series. In addition, "Flexmate" plugs and receptacles are interchangeable and intermateable with all plastic and metal types in the round wire "Micromate" connector series.
10 MCD(**) -15S(****)									
11 MCD(**) -21S(****)									
12 MCD(**) -25S(****)									
13 MCD(**) -31S(****)									
14 MCD(**) -37S(****)									
15 MCD(**) -51S(****)									

CHART III - 19. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact To Center Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
NASA	Note 1	IV-97					Notes 1, 2						
Bulkhead Feed-Through Receptacle	Plug												
1 50M72600-1	50M72637-1		300	3	500	10	0.81x2.14x2.16	24	0.075	1.0	Refer To Mating Plug	2	32
2 50M72600-3	50M72637-3						0.81x2.59x2.16	36		1.5			39
3 50M72600-5	50M72637-5						0.81x3.12x2.16	50		2.0			50
4 50M72600-7	50M72637-7						0.81x3.65x2.16	64		2.5			60
5 50M72600-9	50M72637-9						0.81x4.10x2.16	76		3.0			67
Adapter: Plug To Plug	Plug												
6 95M20000-1	50M72637-1						0.64x1.92x2.09	24		1.0			26
7 95M20000-3	50M72637-3						0.64x2.47x2.09	36		1.5			32
8 95M20000-5	60M72637-5						0.64x2.90x2.09	50		2.0			39
9 95M20000-7	50M72637-7						0.72x3.51x2.09	64		2.5			48
10 95M72000-9	50M72637-9						0.72x3.96x2.09	76		3.0	Refer To Mating Plug		54
Receptacle, Bulkhead Sq. Flange Mount	Plug												
11 50M72629-1	50M72607		300	3	500	10	0.88x0.88x1.55	6		0.25	0.004x0.040	2	9.5
12 50M72629-2	50M72607						1.00x1.00x1.55	12	0.075	0.50	0.004x0.040		23.0
(Continued)													

Note 1: Mated connector assembly consists of one receptacle and two plugs for feed-through and adapter usage.

Note 2: These are maximum dimensions.

CHART III - 19. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (/in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
NASA									
Bulkhead Feed- Through Receptacle									
1 50M72600-1	Not Applicable	Fixed	Spring	Beryllium Copper	100 Gold On 30 Nickel	1400	900	500	133
2 50M72600-3						2300	1100		
3 50M72600-5						2900	1600		
4 50M72600-7						3600	2000		
5 50M72600-9						4500	2500		
Adapter Receptacle									
6 95M20000-1	Not Applicable		Spring	Beryllium Copper		1400	900		
7 95M20000-3						2300	1100		
8 95M20000-5						2900	1600		
9 95M20000-7						3600	2000		
10 95M20000-9						4500	2500		
Receptacle, Bulkhead Sq. Flange Mount									
11 50M72629-1	For Series: Contacts Formed From Cable Conductors	Fixed	Sliding	Copper	100 Gold On 30 Nickel	400	200	500	133
12 50M72629-2						400	200		
(Continued)									

CHART III - 19. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY											
Identification: Manufacturer And Part		Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
NASA		Note 1									
Bulkhead Feed- Through Receptacle											
1	50M72600-1	0.81x2.14x2.16	Aluminum	For Both Series: Black Anodic Coating	To Contact	Dual In-line	For Both Series — Locking: Clip. Safety: Lock- Wire	Screw	None	Yes, Epoxy Compound	For All Series: Rectangular Keyway, One Position
2	50M72600-3	0.81x2.59x2.16									
3	50M72600-5	0.81x3.12x2.16									
4	50M72600-7	0.81x3.65x2.16									
5	50M72600-9	0.81x4.10x2.16									
Adapter Receptacle											
6	95M20000-1	0.64x1.92x2.09			To Contact						
7	95M20000-3	0.64x2.37x2.09									
8	95M20000-5	0.64x2.90x2.09									
9	95M20000-7	0.72x3.51x2.09									
10	95M20000-9	0.72x3.96x2.09									
Receptacle, Bulkhead Sq. Flange Mount											
11	50M72629-1	0.88x0.88x1.06	Aluminum	For Series: Conductive Protective Coating	To Shell To Shell	Dual In-line	For Series: Shell Nut, Safety Lockwire	Screw	None	Yes, Epoxy Compound	
12	50M72629-2	1.00x1.00x1.06									
(Continued)											

Note 1: These are maximum dimensions.

CHART III - 19. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
NASA							Note 1		
Bulkhead Feed- Through Receptacle									
1 50M72600-1	Refer To Mating Plug	-65 To +200	None	Not Applicable	Not Applicable	Military And Aerospace	For All Series: NASA And Contractors As GFE	MIL-C-55544	Type Connections: Flat Conductor Cable To Flat Conductor Cable, Flexible Printed Circuit, Or PC Board
2 50M72600-3									
3 50M72600-5									
4 50M72600-7									
5 50M72600-9									
Adapter Receptacle									
6 95M20000-1									
7 95M20000-3									
8 95M20000-5									
9 95M20000-7									
10 95M20000-9	Refer To Mating Plug								
Receptacle, Bulkhead Sq. Flange Mount									
11 50M72629-1	For Series: Peripheral, Environ- mental, Silicone Rubber	-65 To +200	None	Not Applicable	Not Applicable	Military And Aerospace		MIL-C-55544	Type Connections For Series: FCC To FCC
12 50M72629-2									
(Continued)									

Note 1: GFE: Government Furnished Equipment.

CHART III - 20. CONNECTORS: FLAT TO FLAT, RECEPTACLES

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: H×W×D Or Dia×L (in.)	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)	
NASA (Con.)	Note 1	IV-97											
Receptacle, Bulkhead Single Hole Mount	Plug												
1 50M72630-1	50M72606		300	3	500	10	1.00D×1.55	6	0.25	0.004×0.040	2	11.0	
2 50M72630-2	50M72606		300	3	500	10	1.38D×1.55	12	0.50	0.004×0.040	2	25.0	

Note 1: Mated connector assembly consists of one receptacle and two plugs for feed-through usage.

CHART III - 20. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
NASA (Con.)									
Receptacle, Bulkhead Single Hole Mount									
1 50M72630-1	For Series: Contact Formed From Cable Conductors	Fixed	Sliding	Copper	100 Gold on 30 Nickel	800	400	500	133
2 50M72630-2		Fixed	Sliding	Cooper	100 Gold on 30 Nickel	800	400	500	133

CHART III - 20. CONNECTORS: FLAT TO FLAT, RECEPTACLES

PHYSICAL DATA: ASSEMBLY											
Identification: Manufacturer And Part		Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
NASA (Con.)											
Receptacle, Bulkhead Single Hole Mount											
1	50M72630-1	1.00Dx1.06	Aluminum	For Series: Conductive	To Shell	Dual In-line	For Series: Shell Nut, Safety	Jam Nut	None	Yes, Epoxy	For Series: Rectangular Key- way, One Position
2	50M72630-2	1.38Dx1.06	Aluminum	Protective Coating	To Shell	Dual In-line	Lockwire	Jam Nut	None	Yes, Epoxy	

CHART III - 20. CONNECTORS: FLAT TO FLAT, RECEPTACLES

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
NASA (Con.)							Note 1		
Receptacle, Bulkhead Single Hole Mount									
1 50M72630-1	For Series: Peripheral, Environ- mental, Silicone Rubber	-65 To +200	None	Not Applicable	Not Applicable	Military & Aerospace Military & Aerospace	For Series: NASA & Con- tractors As GFE	MIL-C-55544 MIL-C-55544	Type Connections For Series: FCC To FCC.
2 50M72630-2		-65 To +200	None	Not Applicable	Not Applicable				

Note 1: GFE — Government Furnished Equipment.

CHART III - 21. CONNECTORS: FLAT TO ROUND. PLUGS ATTACHED TO FCC

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
AMP		IV-1											
1 Plug With Or Without Mounting Ears, AMP-UNYT Series	Receptacle With Or Without Mounting Ears, AMP-UNYT Series												
Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle. Thus flat to flat, flat to round, and round to round connections are possible. For part descriptions, refer to charts entitled "Connectors: Flat To Flat."													
2 Ansley Note 1	Note 1	IV-27	1500	3	5000/10 Ft Cable	No Data	0.38×2.80×0.88	15	0.100	1.60	0.004×0.06	1	No Data
3 Plug, Rack And Panel	Receptacle, Rack And Panel						0.38×3.50×0.88	22		2.30			
4							0.38×4.10×0.88	28		2.90			
5							0.38×4.30×0.88	30		3.10			
6			1500	3	5000/10 Ft Cable	No Data	0.38×4.90×0.88	36	0.100	3.70	0.004×0.06	1	No Data
Belling and Lee (Note 3)													
7 Plug, Flexicon Connector Series, Vendor No. 11385	Receptacle, Flexicon Connector Series, Vendor No. 11385												
This connector series has been designed for FCC to FCC, FCC to PC board, and FCC to round wire connections. For available information on the series in general, refer to charts entitled "Connectors: Flat To Flat."													
Berg													
8 Plug, Universal Series	Receptacle, Universal Series												
FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."													

Note 1: For additional mating possibilities, refer to the "Remarks" column.

Note 2: Mated dimensions do not include wire-wrap pin contacts available for receptacle.

Note 3: Belling and Lee of Enfield, England is represented in the U. S. by Ercona Corp. The vendor number given is Ercona's.

CHART III - 21. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
AMP Plug With or Without Mounting Ears, AMP-UNYT Series		Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle. Thus flat to flat, flat to round, and round to round connections are possible. For part descriptions, refer to charts entitled "Connectors: Flat To Flat."							
Ansley Plug, Rack And Panel For Series: Contacts Formed From Cable Conductors		Fixed	Sliding	Depends on FCC Type	Gold	No Data	No Data	No Data	No Data
		Fixed	Sliding	Depends on FCC Type	Gold	No Data	No Data	No Data	No Data
Belling and Lee									
Plug, Flexicon Connector Series Vendor No. 11385		This connector series has been designed for FCC to FCC, FCC to PC board, and FCC to round wire connections. For available information on the series in general, refer to charts entitled "Connectors: Flat To Flat."							
Berg									
Plug, Universal Series		FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."							

CHART III - 21. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP										
1 Plug With Or Without Mounting Ears, AMP-UNYT Series		Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle. Thus flat to flat, flat to round, and round to round connections are possible. For part descriptions, refer to charts entitled "Connectors: Flat To Flat."								
Ansley										
2 Plug, Rack and Panel	No Data	Polycarbonate Resin	None	None	Dual, Staggered	Screw	Screw	None	None Required	None
3										
4										
5										
6	No Data	Polycarbonate Resin	None	None	Dual, Staggered	Screw	Screw	None	None Required	None
Belling and Lee										
7 Plug, Flexicon Connector Series Vendor No. 11385		This connector series has been designed for FCC to FCC, FCC to PC board, and FCC to round wire connections. For available information on the series in general, refer to charts entitled "Connectors: Flat to Flat, Plugs."								
Berg										
8 Plug, Universal Series		FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."								

CHART III - 21. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1 AMP Plug With Or Without Mounting Ears, AMP-UNYT Series									Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle. Thus flat to flat, flat to round, and round to round connections are possible. For part description, refer to charts entitled "Connectors: Flat To Flat."
2 Ansley Plug, Rack and Panel	None	85 Max	No Data	Mechanical	Gold Over Nickel	Ansley Expandable Rack And Panel Connector System: Test Equipment Racks, Computers, Instrumentation Banks, And Data Processing Equip- ment And Machin- ery Which Requires Chassis Movement And Disconnection	Stock	No Data	Type Connections: FCC To Round Wire (Stranded Or Solid). The plug may be obtained as part of the Ansley expandable rack and panel connector sys- tem which consists of a coiled length of FCC with mated connector at either end.
3 4 5 6									
7 Belling and Lee Plug, Flexicon Connector Series Vendor No. 11385									This connector series has been designed for FCC to FCC, FCC to PC board, and FCC to round wire connections. For available information on the series in general, refer to charts entitled "Connectors: Flat To Flat, Plugs."
8 Berg Plug, Universal Series									FCC or round wire can be used in members of the Universal connector series. Therefore flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."

CHART III - 22. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
1	ITT Cannon Plug, Flat Backshell Series FC* 1	IV-53										
	Receptacle, Flat Backshell Series FC* 3, Round Backshell Series FC* 4, Box Mounted Backshell Series FC* 5, Box Mounted Backshell Pressure Sealed Series FC* 6											
2	Kings Plug	IV-67										
	F5510-170-00, -171- F3510-175-00											
3	F5510-220-00, -221- F3510-225-00											
4	F5510-270-00, -271- F3510-275-00											
5	F5510-320-00, -321- F3510-325-00											
6	Microdot "Flexmate" Plug Series	IV-79										
	"Micromate" Receptacle Series											
7	NASA Plug	IV-97										
	50M72637-1 50M72646-1											
8	50M72637-3 50M72646-3											
												</

The removable water concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with the plug. Refer to "Connectors: Flat To Flat" for complete part descriptions. Dimensions on the round backshell receptacle series FC*4 can be located in Section IV, "Manufacturers' Data."

Refer to "Connectors: Flat To Flat, Plugs" for complete part descriptions. Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted here.

Components in the "Flexmate" connector series are intermountable and intermateable with all plastic and metal types in the round wire "Micromate" connector series. Within the "Flexmate" series, plugs and receptacles mate for flat cable to flat cable connections. For plug information, refer to "Connectors: Flat To Flat, Plugs."

Refer to "Connectors: Flat To Flat, Plugs." Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted in this chart.

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CHART III - 22. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: Hx WxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
1	ITT Cannon Plug, Flat Backshell Series FC*1									
2	F5510-170-00, -171									
3	F5510-220-00, -221									
4	F5510-270-00, -271									
5	F5510-320-00, -321									
6	Microdot "Flexmate" Plug Series									
7	NASA Plug 50M72637-1									
8	50M72637-3									
	(Continued)									

The removable water concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with the plug. Refer to "Connectors: Flat To Flat" for complete part descriptions. Dimensions on the round backshell receptacle series FC*4 can be located in Section IV, "Manufacturers' Data."

Refer to "Connectors: Flat To Flat, Plugs" for complete part descriptions. Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted here.

Components in the "Flexmate" connector series are intermountable and intermateable with all plastic and metal types in the round wire "Micromate" connector series. Within the "Flexmate" series, plugs and receptacles mate for flat cable to flat cable connections. For plug information, refer to "Connectors: Flat To Flat, Plugs."

Refer to "Connectors: Flat To Flat, Plugs." Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted in this chart.

CHART III - 22. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1 ITT Cannon Plug, Flat Backshell Series FC# 1									
2 Kings Plug F5510-170-00, -171-									
3 F5510-220-00, -221-									
4 F5510-270-00, -271-									
5 F5510-320-00, -321-									
6 Microdot "Flexmate" Plug Series									
7 NASA Plug 50M72637-1									
8 50M72637-3									
(Continued)									

CHART III - 23. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
NASA (Con.)		IV-97											
Plug (Continued)	Receptacle												
1 50M72637-5	50M72646-5						0.80x3.11x1.74				Refer to "Connectors: Flat To Flat, Plugs." Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted in this chart.		
2 50M72637-7	50M72646-7						0.88x3.71x1.74						
3 50M72637-9	50M72646-9						0.88x4.16x1.74						
Plug	Bulkhead Receptacles, Sq. Flange Mount												
4 50M72607	50M72602-1						0.88x0.88x1.44				Refer to "Connectors: Flat To Flat, Plugs." Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted in this chart.		
	Single Hole Mount						1.00Dx1.44						
	50M72603-1												
Plug	Bulkhead Receptacles, Sq. Flange Mount												
5 50M72606	50M72602-3						1.00x1.00x1.44				Refer to "Connectors: Flat To Flat, Plugs." Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted in this chart.		
	Single Hole Mount						1.38Dx1.44						
	50M72603-3												

CHART III - 23. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
NASA (Con.)									
<u>Plug (Continued)</u>									
1 50M72637-5		Refer to "Connectors: Flat To Flat, Plugs." Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted in this chart.							
2 50M72637-7									
3 50M72637-9									
<u>Plug</u>									
4 50M72607		Refer to "Connectors: Flat To Flat, Plugs." Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted in this chart.							
<u>Plug</u>									
5 50M72606		Refer to "Connectors: Flat To Flat, Plugs." Only differences occurring when plugs (attached to FCC) are mated for flat to round connections are noted here.							

CHART III - 23. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
NASA (Con.)										
Plug (Continued)										
1 50M72637-5										
2 50M72637-7										
3 50M72637-9										
Plug										
4 50M72607										
Plug										
5 50M72606										

CHART III -23. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO FCC

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1									Type Connections: FCC To Round Wire. Plugs can also be mated for flat to flat connections.
2									
3									
4									
5									

CHART III - 24. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)					
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T x W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
AMP		IV-1										
1 Plug, Receptacle With Or Without Mounting Ears, AMP-UNYT Series												
2 Plug, NAFI Style MIL-C-28754 Crimp Blade 86597-3												
3 Plug, Universal Series												
4 Plug, Flat Backshell Series FC*1												
5 FC*2B*****												
(Continued)												

Note 1: The asterisks within part numbers indicate variable characteristics. A complete part number explanation can be found in Section IV, "Manufacturers' Data." For additional information on mating possibilities, refer to the last column, "Remarks."

Note 2: Depth measurements are maximum.

CHART III- 24. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
1 AMP Plug With Or Without Mounting Ears, AMP-UNYT Series									
2 Plug, NAFI Style Crimp Blade 86597-3			Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle, with or without mounting ears. Thus, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."						
3 Berg Plug, Universal Series			FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."						
4 ITT Cannon Plug, Flat Backshell Series FC* 1			The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with the plug. Refer to "Connectors: Flat To Flat" for complete part descriptions.						
5 FC*2B***** (Continued)	Crimp	Removable Wafer With Fixed Contacts	Pin or Socket	No Data	50 Gold Min	2700 For Shell, Add 230 Per Contact	900 For Shell, Add 170 Per Contact	500	127

CHART III - 24. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP										
1 Plug, With Or Without Mounting Ears, AMP-UNYT Series		Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle, with or without mounting ears. Thus, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."								
2 Plugs, NAFI Style Crimp Blade 86597-3		Round wire and FCC can be intermixed in this plug. Thus, flat to flat, flat to round, and round to round connections are possible. For a complete part description, refer to charts entitled "Connectors: Flat To Flat."								
Berg										
3 Plug, Universal Series		FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."								
ITT Cannon	Note 1									
4 Plug, Flat Backshell Series FC* 1		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with the plug. Refer to "Connectors: Flat To Flat" for complete part descriptions.								
Plug, Round Backshell										
5 FC* 2B*****	0, 69x1. 45x1. 66	Aluminum Alloy	Cadmium Plate	Threaded For Shield Ground- ing Swedge Ring Nut Assemblies	1, 2, or 3 Rows In-line	Jackscrews	Side Mount Blocks, Also See Mating Part	None	Yes	Wafers Are Posi- tioned And Polar- ized, The Shell Has Key Clips For 9 Positions
(Continued)										

Note 1: Depth Measurements are Maximum.

CHART III - 24. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1 AMP Plug With Or Without Mounting Ears, AMP-UNYT Series									
2 Plug, NAFI Style Crimp Blade 86597-3									
3 Berg Plug, Universal Series									
4 ITT Cannon Plug, Flat Backshell Series FC*1									
5 FC*2B***** Plug, Round Backshell									
(Continued)									

CHART III - 25. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufac- turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
ITT Cannon (Con.) Note 1	Note 1	IV-53					Note 2		Note 3				
Plug, Round Backshell (Con.)	Receptacle, Backshell: Flat (FC* 3), Box Mount- ed (FC* 5), Box Mounted Pressure Sealed (FC* 6)												
1	FC* 2C*****		600	3	5000	No Data	$\frac{0.71}{0.69} \times 1.90 \times 2.63$ $\frac{0.71}{0.69} \times 1.90 \times 2.43$ $\frac{0.71}{0.69} \times 1.90 \times 2.43$ $\frac{0.71}{0.69} \times 1.90 \times 2.43$	17, 12, Or 9 Per Cable Layer	0.050, 0.075, 0.100	See Mating Part	24-30 AWG	See Mating Part	No Data
2	FC* 2D*****						$\frac{0.71}{0.69} \times 2.40 \times 2.73$ $\frac{0.71}{0.69} \times 2.40 \times 2.53$ $\frac{0.71}{0.69} \times 2.40 \times 2.53$	27, 18, Or 14 Per Cable Layer					
3	FC* 2E*****						$\frac{0.71}{0.69} \times 2.90 \times 2.84$ $\frac{0.71}{0.69} \times 2.90 \times 2.64$ $\frac{0.71}{0.69} \times 2.90 \times 2.64$	37, 25, Or 19 Per Cable Layer					
4	FC* 2F*****		600	3	5000	No Data	$\frac{0.71}{0.69} \times 3.40 \times 2.94$ $\frac{0.71}{0.69} \times 3.40 \times 2.74$ $\frac{0.71}{0.69} \times 3.40 \times 2.74$	47, 32, Or 24 Per Cable Layer	0.050, 0.075, 0.100	See Mating Part	24-30 AWG	See Mating Part	No Data
(Continued)													

Note 1: The asterisks within part numbers indicate variable characteristics. A complete part number explanation can be found in Section IV, "Manufacturers' Data."

For additional information on mating possibilities, refer to the last column, "Remarks."

Note 2: Depth measurements are maximum.

Note 3: For each group of three contact numbers, 0.050 is the center-to-center contact spacing for the maximum contact number, 0.100 for the minimum.

CHART III - 25. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
ITT Cannon (Con.)									
Plug, Round Backshell (Con.)									
1 FC* 2C*****	Crimp	Removable Wafer With Fixed Contacts	Pin Or Socket	No Data	50 Gold Min	3600 For Shell, Add 230 Per Contact	1800 For Shell, Add 170 Per Contact	500	127
2 FC* 2D*****						4500 For Shell, Add 230 Per Contact	2700 For Shell, Add 170 Per Contact		
3 FC* 2E*****						5400 For Shell, Add 230 Per Contact	3600 For Shell, Add 170 Per Contact		
4 FC* 2F*****	Crimp	Removable Wafer With Fixed Contacts	Pin Or Socket	No Data	50 Gold Min	6400 For Shell, Add 230 Per Contact	4500 For Shell, Add 170 Per Contact	500	127
(Continued)									

CHART III - 25. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
ITT Cannon (Con.)	Note 1									
Plug, Round Backshell (Con.)										
1 FC* 2C*****	0.69x1.90x1.74	Aluminum Alloy	Cadmium Plate	For Series: Threaded For Shield Ground- ing Swedge Ring Nut Assemblies	1, 2, Or 3 Rows In-line	Jackscrews	For Series: Side Mount Blocks, Also See Mating Part	None	Yes	For Series: Wafers Are Positioned And Polarized, The Shell Has Key Clips For 9 Positions
2 FC* 2D*****	0.69x2.40x1.84									
3 FC* 2E*****	0.69x2.90x1.95									
4 FC* 2F*****	0.69x3.40x2.05	Aluminum Alloy	Cadmium Plate		1, 2, Or 3 Rows In-line	Jackscrews		None	Yes	
(Continued)										

Note 1: Depth measurements are maximum.

CHART III - 25. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
ITT Cannon (Con.)									
Plug, Round Backshell (Con.)									
1 FC* 2C*****	Interfacial And Peripheral, Environ- mental, Silicone Rubber	No Data	No Data	No Data	No Data	Military: Missiles	Not Tooled	MIL-C-55544	Type Flat To Round (Attached To Round Wire) Connections: FCC To Shielded Round Wire Bundles. Plug can also be mated for round to round connections. An RFI seal is provided.
2 FC* 2D*****									
3 FC* 2E*****									
4 FC* 2P*****		No Data	No Data	No Data	No Data	Military: Missiles	Not Tooled	MIL-C-55544	
(Continued)									

CHART III - 26. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
ITT Cannon (Con.) Note 1	Note 1	IV-53					Note 2						
Plug, Round Backshell (Continued)	Receptacle, Backshell: Flat (FC*3), Box Mounted (FC*5), Box Mounted Pressure Sealed (FC*6)												
FC*2G*****	FC*3G*****		600	3	5000	No Data	$\frac{0.71}{0.69} \times 3.90 \times 3.01$ $\frac{0.71}{0.69} \times 3.90 \times 2.81$ $\frac{0.71}{0.69} \times 3.90 \times 2.81$	57, 38, Or 29 Per Cable Layer With 38, 0.100 With 29	0.050 With 57 Contacts, 0.075 With 38, 0.100 With 29	See Mating Part	24-30 AWG	See Mating Part	No Data
FC*5G*****													
FC*6G*****													
Kings Note 3	Notes 3, 4	IV-67					Note 5						
Plug	Jack												
F5510-175-00	F5510-170-00		750	2	No Data	20	$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$ $\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$ $\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$	17	0.050	For Series: See Mating Part	AWG 28	For Series: See Mating Part	30
F5510-225-00	F5510-220-00							22					35
F5510-275-00	F5510-270-00							27					40
F5510-325-00	F5510-320-00		750	2	No Data	20	$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$ $\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$	32	0.050	For Series: See Mating Part	AWG 28	For Series: See Mating Part	4
Microdot		IV-79											
"Micromate" Plug Series	"Flexmate" Receptacle Series		All plastic and metal components in the round wire "Micromate" connector series are intermountable and interchangeable with parts in the "Flexmate" FCC connector series. Contact Microdot for plug information.										

Note 1: The asterisks within part numbers indicate variable characteristics. A complete part number explanation can be found in Section IV "Manufacturers' Data." For additional information on mating possibilities, refer to the last column, "Remarks."

Note 2: The depth measurement is maximum.

Note 3: Refer to last column, "Remarks," for information on additional mating possibilities.

Note 4: Receptacle pairs vary in FCC insulation thickness.

Note 5: Members of each receptacle pair per plug have the same dimensions.

CHART III -26. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (min.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
1	ITT Cannon (Con.) <u>Plug.</u> <u>Round Backshell</u> <u>(Continued)</u> FC* 2G***** Crimp	Removable Wafer With Fixed Contacts	Pin Or Socket	No Data	50 Gold Minimum	7300 For Shell, Add 230 Per Contact	5400 For Shell, Add 170 Per Contact	500	127
2	Kings <u>Plug</u> F5510-175-00	Removable	Sliding	Beryllium Copper	50 Gold	No Data	No Data	250	No Data
3	F5510-225-00								
4	F5510-275-00								
5	F5510-325-00								
6	Microdot "Micromate" <u>Plug Series</u>	All plastic and metal components in the round wire "Micromate" connector series are intermountable and intermateable with parts in the "Flexmate" FCC connector series. Contact Microdot for plug information.							

CHART III - 26. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
ITT Cannon (Con.)										
<u>Plug</u> Round Backshell (Continued)										
1 FC* 2G*****	0.69x3.90x2.14	Aluminum Alloy	Cadmium Plate	Threaded For Shield Ground- ing Swedge Ring Nut Assemblies	1, 2, Or 3 Rows In-line	Jackscrews	Side Mount Blocks, Also See Mating Part	None	None	Wafers Are Positioned And Polarized. The Shell Has Key Clips For 9 Positions
Kings										
<u>Plug</u>										
2 F5510-175-00	$\frac{5}{16} \times 2 \frac{1}{16} \times \frac{11}{16}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Offset
3 F5510-225-00	$\frac{5}{16} \times 2 \frac{1}{16} \times \frac{11}{16}$									
4 F5510-275-00	$\frac{5}{16} \times 2 \frac{9}{16} \times \frac{11}{16}$									
5 F5510-325-00	$\frac{5}{16} \times 2 \frac{13}{16} \times \frac{11}{16}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Offset
Microdot										
"Micromate" <u>Plug Series</u>		All plastic and metal components in the round wire "Micromate" connector series are intermountable and interchangeable with parts in the "Flexmate" FCC connector series. Contact Microdot for plug information								

CHART III - 26. CONNECTORS: FLAT TO ROUND, PLUGS ATTACHED TO ROUND WIRE

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1	ITT Cannon (Con.) <u>Plug.</u> <u>Round Backshell</u> (Continued) FC* 2G*****	No Data	No Data	No Data	No Data	Military: Missiles	Not Tooled	MIL-C-55544	Type Flat To Round (Attached To Round Wire) Connections: FCC To Shielded Round Wire Bundles. Plugs can also be mated for round to round connections. An RFI seal is provided.
2	<u>Plug</u> E5510-175-00	-55 To +180	None	None Required	None	Military And Commercial Uses For Series: Computers, Communications, Data Processing Equipment, Office Equipment, Includ- ing Copiers, Aircraft	1 Year Produc- tion	For Series: Designed To Applicable Military Specifi- cations. Not Qualified At This Time	Type Flat To Round Connections For Series: FCC To 0, 032 in Dia- meter Ribbon Cable. Plugs can also be mated with additional receptacles for round to round connections.
3	F5510-225-00								
4	F5510-275-00								
5	F5510-325-00	-55 To +180	None	None Required	None		1 Year Produc- tion		
6	<u>Microdot</u> <u>"Micromate"</u> <u>Plug Series</u>	All plastic and metal components in the round wire "Micromate" connector series are intermountable and interchangeable with parts in the "Flexmate" FCC connector series. Contact Microdot for plug information.							

CHART III - 27. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO FCC

IDENTIFICATION			ELECTRICAL DATA			PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: H×W×D Or Dia×L (in.)	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
AMP		IV-1										
1	Receptacle With Or Without Mounting Ears, AMP-UNYT Series	Plug With Or Without Mounting Ears AMP-UNYT Series										
2	Belling and Lee Note 1											
	Receptacle, Flexicon Connector Series, Vendor No. 11385	Plug, Flexicon Connector Series, Vendor No. 11385										
3	Berg											
	Receptacle, Universal Series	Plug, Universal Series										
4	ITT Cannon	IV-53										
	Receptacle, Flat Backshell Series FC*3	Plug, Flat Backshell Series FC*1 Round Backshell Series FC*2										
5	Receptacle, Box Mounted Series FC*5	Plug, Flat Backshell Series FC*1 Round Backshell Series FC*2										
(Continued)												

Note 1: Belling and Lee of Enfield, England is represented in the United States by the Ercona Corporation. The vendor number is Ercona's.

CHART III - 27. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO FCC

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
AMP Receptacle With Or Without Mounting Ears AMP-UNYT Series									
Belling and Lee									
Receptacle, Flexicon Connector Series, Vendor No. 11385									
Berg Receptacle, Universal Series									
ITT Cannon Receptacle, Flat Backshell Series FC# 3									
Receptacle, Box Mounted Backshell Series FC# 5									

CHART III - 27. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO FCC

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP										
1 Receptacle With Or Without Mounting Ears AMP-UNYT Series										
Belling and Lee										
2 Receptacle, Flexicon Connector Series, Vendor No. 11385										
Berg										
3 Receptacle, Universal Series										
ITT Cannon										
4 Receptacle, Flat Backshell Series FC# 3										
5 Receptacle, Box Mounted Backshell Series FC# 5										
(Continued)										

CHART III - 27. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO FCC

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
AMP									
1 Receptacle With Or Without Mounting Ears, AMP-UNYT Series									Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle, with or without mounting ears. Thus, flat to flat, flat to round, and round to round connections are possible. For part descriptions, refer to charts entitled "Connectors: Flat To Flat."
Belling and Lee									
2 Receptacle, Flexicon Connector Series, Vendor No. 11385									This connector series has been designed for FCC to FCC, FCC to PC board, and FCC to round wire connections. For available information on the series in general, refer to charts entitled "Connectors: Flat To Flat."
Berg									
3 Receptacle, Universal Series									FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."
ITT Cannon									
4 Receptacle, Flat Backshell Series FC* 3									The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.
5 Receptacle, Box Mounted Backshell Series FC* 5									The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.
(Continued)									

CHART III - 28. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO FCC

IDENTIFICATION			ELECTRICAL DATA			PHYSICAL DATA: GENERAL (Physical Data Continued)							
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
ITT Cannon (Con.)		IV-53											
Receptacle, Box Mounted Backshell, Pressure Sealed Series FC*6	Plug, Flat Backshell Series FC*1 Round Backshell Series FC*2												
The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to "Connectors: Flat To Flat" for complete part descriptions. Dimensions on the round backshell plug series FC*2 can be located in Section IV, "Manufacturers' Data. "													
Kings		IV-67											
Receptacle	Plug												
F3510-170-00, -171	F5510-175-00						$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$				Refer to "Connectors: Flat To Flat, Receptacles" for complete part descriptions. Only differences occurring when receptacles (attached to FCC) are mated for flat to round connections are noted here.		
F3510-220-00, -221	F5510-225-00						$\frac{5}{16} \times 2 \frac{5}{16} \times 1 \frac{3}{16}$						
F3510-270-00, -271	F5510-275-00						$\frac{5}{16} \times 2 \frac{9}{16} \times 1 \frac{3}{16}$						
F3510-320-00, -321	F5510-325-00						$\frac{5}{16} \times 2 \frac{13}{16} \times 1 \frac{3}{16}$						
Microdot		IV-79											
"Flexmate" Receptacle Series	"Micromate" Plug Series												
Components in the "Flexmate" FCC connector series are intermountable and interchangeable with all plastic and metal types in the round wire "Micromate" connector series. For receptacle information, refer to charts entitled Connectors: Flat To Flat, Receptacles. "													

Refer to "Connectors: Flat To Flat, Receptacles" for complete part descriptions. Only differences occurring when receptacles (attached to FCC) are mated for flat to round connections are noted here.

Components in the "Flexmate" FCC connector series are intermountable and interchangeable with all plastic and metal types in the round wire "Micromate" connector series. For receptacle information, refer to charts entitled Connectors: Flat To Flat, Receptacles."

CHART III - 28. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO FCC

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
1 ITT Cannon (Con.) Receptacle, Box Mounted Backshell, Pressure Sealed Series FC#6									
Kings									
2 Receptacle F3510-170-00, -171-									
3 F3510-220-00, -221-									
4 F3510-270-00, -271-									
5 F3510-320-00, -321-									
Microdot									
6 "Flexmate" Receptacle Series									

The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.

Refer to "Connectors: Flat To Flat, Receptacles" for complete part descriptions. Only differences occurring when receptacles (attached to FCC) are mated for flat to round connections are noted here.

Components in the "Flexmate" FCC connector series are intermountable and intermateable with all plastic and metal types in the round wire "Micromate" connector series. For receptacle information, refer to charts entitled "Connectors: Flat To Flat, Receptacles."

CHART III - 28. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO FCC

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
1 ITT Cannon (Con.) Receptacle, Box Mounted Backshell, Pressure Sealed Series FC* 6										
2 Kings Receptacle										
3 F3510-170-00, -171-										
4 F3510-220-00, -221-										
5 F3510-270-00, -271-										
6 F3510-320-00, -321-										
Microdot										
"Flexmate" Receptacle Series										

The removable water concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.

Refer to "Connectors: Flat To Flat, Receptacles" for complete part descriptions. Only differences occurring when receptacles (attached to FCC) are mated for flat to round connections are noted here.

Components in the "Flexmate" FCC connector series are intermountable and interchangeable with all plastic and metal types in the round wire "Micromate" connector series. For receptacle information, refer to charts entitled: "Connectors: Flat To Flat, Receptacles."

CHART III - 28. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO FCC

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1 ITT Cannon (Con.) Receptacle, Box Mounted Backshell, Pressure Sealed Series FC* 6			The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.						
Kings Receptacle									
2 F 3510-170-00, -171-			Refer to "Connectors: Flat To Flat, Receptacles" for complete part descriptions. Only differences occurring when receptacles (attached to FCC) are mated for flat to round connections are noted here.						Flat To Round Connections: FCC To Rib- bon Cable. Receptacles also mate for flat to flat connections.
3 F 3510-220-00, -221-									
4 F 3510-270-00, -271-									
5 F 3510-320-00, -321-									
Microdot "Flexmate" Receptacle Series			Components in the "Flexmate" FCC connector series are intermountable and intermateable with all plastic and metal types in the round wire "Micromate" connector series. For receptacle information, refer to charts entitled "Connectors: Flat To Flat, Receptacles."						

CHART III - 29. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
AMP		IV-1											
1	Receptacle With Or Without Mounting Ears, AMP-UNYT Series	Plug With Or Without Mounting Ears, AMP-UNYT Series	Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle, with or without mounting ears. Thus flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."										
2	Ansley Note 1	Note 1					Note 2						
3	Receptacle, Rack And Panel	Plug, Rack And Panel	1500	3	5000/10 ft Cable	No Data	0.38x2.80x0.88	15	0.100	For Series See Mating Part	20-24 AWG	For Series: See Mating Part	No Data
4							0.38x3.50x0.88	22					
5							0.38x4.10x0.88	28					
6							0.38x4.30x0.88	30					
			1500	3	5000/10 ft Cable	No Data	0.38x4.90x0.88	36	0.100		20-24 AWG		No Data
7	Berg												
	Receptacle, Universal Series	Plug, Universal Series	FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."										
	ITT Cannon	IV-53											
8	Receptacle, Flat Backshell Series FC# 3	Plug, Flat Backshell Series FC# 1	The removable wafer concept allows for intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.										

Note 1: For additional mating possibilities, refer to "Remarks" column.

Note 2: Mated dimensions do not include wire-wrap pin contacts for receptacles.

CHART III - 29. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
AMP 1 Receptacle With Or Without Mounting Ears, AMP-UNYT Series			Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle, with or without mounting ears. Thus flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."						
Ansley 2 Receptacle, Rack And Panel	Crimp Or Wire Wrap	Fixed	Spring	Beryllium Copper	Gold	No Data	No Data	No Data	No Data
3									
4									
5									
6	Crimp Or Wire Wrap	Fixed	Spring	Beryllium Copper	Gold	No Data	No Data	No Data	No Data
Berg 7 Receptacle, Universal Series			FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."						
ITT Cannon 8 Receptacle, Flat Backshell Series FC* 3			The removable wafer concept allows for intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.						
(Continued)									

CHART III - 29. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
AMP										
1 Receptacle With Or Without Mounting Ears. AMP-UNYT Series		Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle, with or without mounting ears. Thus, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."								
Ansley										
2 Receptacle, Rack And Panel	No Data	Polycarbonate Resin	None	None	Dual, Staggered	Screw	Screw	None	None Required	Polarity Key
3										
4										
5										
6	No Data	Polycarbonate Resin	None	None	Dual, Staggered	Screw	Screw	None	None Required	Polarity Key
Berg										
7 Receptacle, Universal Series		FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."								
ITT Cannon										
8 Receptacle, Flat Backshell Series FC* 3		The removable wafer concept allows for intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.								
(Continued)										

CHART III - 29. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
AMP									
1 Receptacle With Or Without Mounting Ears, AMP-UNYT Series			Round wire and FCC can be intermixed in any AMP-UNYT plug or receptacle, with or without mounting ears. Thus, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."						
Ansley									
2 Receptacle, Rack And Panel	None	85 Max	Contact Crimper	Mechanical	Gold Over Nickel	Ansley Expandable Rack And Panel Connector System: Test Equipment Racks, Computers, Instrumentation Banks, And Data Processing Equip- ment And Machinery Which Requires Chassis Movement And Disconnection	Stock	No Data	Type Connection For Series: FCC To Round Wire (Stranded Or Solid). This receptacle may be obtained as part of the Ansley expandable rack and panel connector system which consists of a coiled length of FCC with mated connectors at either end.
3									
4									
5									
6	None	85 Max	Contact Crimper	Mechanical	Gold Over Nickel		Stock	No Data	
Berg									
7 Receptacle, Universal Series			FCC or round wire can be used in members of the Universal connector series. Therefore, flat to flat, flat to round, and round to round connections are possible. For complete part descriptions, refer to charts entitled "Connectors: Flat To Flat."						
ITT Cannon									
8 Receptacle, Flat Backshell Series FC* 3			The removable wafer concept allows for intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.						
(Continued)									

CHART III - 30. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufac-turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
ITT Cannon (Con.) Note 1	Note 1	IV-53						Note 3	Note 4				
Receptacle, Round Backshell FC*4B*****	Plug, Flat Backshell FC*1B*****		No Data	3	No Data	No Data	0.71 ×1.45×2.54 0.69 ×1.45×2.54 0.71 ×1.90×2.62 0.69 ×1.90×2.62 0.71 ×2.40×2.72 0.69 ×2.40×2.72 0.71 ×2.90×2.83 0.69 ×2.90×2.83 0.71 ×3.40×2.93 0.69 ×3.40×2.93 0.71 ×3.90×3.00 0.69 ×3.90×3.00	7, 6, or 4 17, 12, or 9 27, 18, or 14 37, 25, or 19 47, 32 or 24 57, 38, or 29	0.050, 0.075, 0.100	See Mating Part	24-30 AWG	See Mating Part	No Data
2 FC*4C*****	FC*1C*****												
3 FC*4D*****	FC*1D*****												
4 FC*4E*****	FC*1E*****												
5 FC*4F*****	FC*1F*****												
6 FC*4G*****	FC*1G*****		No Data	3	No Data	No Data			0.050, 0.075, 0.100	See Mating Part	24-30 AWG	See Mating Part	No Data
7 Receptacle, Box Backshell Series FC* 5	Plug, Flat Backshell Series FC* 1		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.										
8 Receptacle, Box Backshell, Pressure Sealed Series FC* 6	Plug, Flat Backshell Series FC* 1		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.										

Note 1: Asterisks within part numbers indicate variable characteristics. A complete part number explanation can be found in Section IV, "Manufacturers' Data." For more information on mating possibilities, refer to the last column, "Remarks."
Note 2: Depth measurements are maximum.

Note 3: Contact numbers are given per cable layer.
Note 4: For each group of three contact numbers, 0.050 is the center-to-center spacing for the maximum contact number, 0.100 for the minimum.

CHART III - 30. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
ITT Cannon (Con.)						Note 1	Note 1		
Receptacle, Round Backshell FC*4B*****	Crimp	For Series: Removable Wafer With Fixed Contacts	Pin Or Socket	No Data	No Data	Shell: 2700	Shell: 900	500	No Data
FC*4C*****						Shell: 3600	Shell: 1800		
FC*4D*****						Shell: 4500	Shell: 2700		
FC*4E*****						Shell: 5400	Shell: 3600		
FC*4F*****						Shell: 6400	Shell: 4500		
FC*4G*****	Crimp		Pin Or Socket	No Data	No Data	Shell: 7300	Shell: 5400	500	No Data
Receptacle, Box Backshell Series FC* 5		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.							
Receptacle, Box Backshell, Pressure Sealed Series FC* 6		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.							

Note 1: Add 230 grams per contact for total mating force, 170 grams per contact for total unmating force.

CHART III - 30. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
ITT Cannon (Con.)	Note 1									
Receptacle Round Backshell										
1 FC*4B*****	0.71 x1.45x1.66 0.69	Aluminum Alloy	No Data	For Series: Threaded For Shield Ground- ing Swedge Ring Nut Assemblies	1, 2, Or 3 Rows In-line	Jackscrews	For Series: Jackscrews Side Mount Blocks	None	Yes	For Series: Wafers Are Posi- tioned And Polar- ized, The Shell Has Key Clips For 9 Positions.
2 FC*4C*****	0.71 x1.90x1.74 0.69									
3 FC*4D*****	0.71 x2.40x1.84 0.69									
4 FC*4E*****	0.71 x2.90x1.95 0.69									
5 FC*4F*****	0.71 x3.40x2.05 0.69									
6 FC*4G*****	0.71 x3.90x2.12 0.69	Aluminum Alloy	No Data		1, 2, Or 3 Rows In-line	Jackscrews		None	Yes	
7 Receptacle, Box Backshell Series FC* 5		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.								
8 Receptacle, Box Backshell, Pressure Sealed Series FC* 6		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.								

Note 1: Depth measurements are maximum.

CHART III - 30. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
ITT Cannon (Con.)									
Receptacle, Round Backshell									
1 FC*4B*****	For Series: Interfacial And Periph-	No Data	No Data	No Data	No Data	Military: Missiles	No Data	MIL-C-55544	Type Flat To Round (Attached To Round Wire) Connections For Series: FCC To Shielded Round Wire Bundles. Recep- tacles can also be mated for round to round connec- tions. An RFI seal is provided.
2 FC*4C*****	eral, Envi-								
3 FC*4D*****	ronmental, Silicon								
4 FC*4E*****	Rubber								
5 FC*4F*****									
6 FC*4G*****		No Data	No Data	No Data	No Data	Military: Missiles	No Data	MIL-C-55544	
7 Receptacle, Box Backshell, Series FC* 5		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.							
8 Receptacle, Box Backshell, Pressure Sealed Series FC* 6		The removable wafer concept allows intermixing of round wire and FCC. Thus, flat to flat, flat to round, and round to round connections are possible with this receptacle. Refer to charts entitled "Connectors: Flat To Flat" for complete part descriptions.							

CHART III - 31. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)										
Manufacturer And Part	Mating Part	Manufac- turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)				
Kings Note 1			Notes 1, 2				Note 3										
Jack Receptacle			Plug														
1 F3510-175-00	F5510-170-00	IV-67	750	2	No Data	20	$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$	17	0.050	For Series See Mating Part	AWG 28	For Series: See Mating Part	30				
2 F3510-225-00	F5510-171-00							22					35				
3 F3510-275-00	F5510-221-00							27					40				
4 F3510-325-00	F5510-270-00							$\frac{5}{16} \times 2 \frac{1}{16} \times 1 \frac{3}{16}$					45				
	F5510-271-00							32									
Microdot																	
"Micromate" Receptacle Series			"Flexmate" Plug Series				All plastic and metal components in the round wire "Micromate" connector series are intermountable and interchangeable with parts in the "Flexmate" FCC connector series. Contact Microdot for receptacle information.										
NA SA			IV-97														
Bulkhead Receptacle			Plug														
6 50M72646-1	50M72637-1	IV-97	300	3	500	10	0.80x2.13x1.74	24	0.075	For Series See Mating Part	27 AWG	For Series: See Mating Part	29				
7 50M72646-3	50M72637-3							36					35				
8 50M72646-5	50M72637-5							50					42				
9 50M72646-7	50M72637-7							64					55				
10 50M72646-9	50M72637-9							76					66				
(Continued)																	

Note 1: See last column, "Remarks," for information on additional mating possibilities.

Note 2: Plug pairs differ in FCC insulation thickness.

Note 3: Members of each plug pair per receptacle have the same dimensions.

Note 4: These are maximum dimensions.

CHART III - 31. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
Kings									
<u>Jack Receptacle</u>									
1 F3510-175-00	Insulation Piercing	Removable	Socket	Beryllium Copper	50 Gold	No Data	No Data	250	No Data
2 F3510-225-00									
3 F3510-275-00	Insulation Piercing	Removable	Socket	Beryllium Copper	50 Gold	No Data	No Data	250	No Data
4 F3510-325-00									
Microdot									
5 "Micromate" Receptacle Series	All plastic and metal components in the round wire "Micromate" connector series are intermountable and interchangeable with parts in the "Flexmate" FCC connector series. Contact Microdot for receptacle information.								
NASA									
<u>Bulkhead Receptacle</u>									
6 50M72646-1	Solder	Fixed	Spring	Beryllium Copper	100 Gold On 30 Nickel	1300	900	500	100
7 50M72646-3						2300	1100		
8 50M72646-5						2900	1600		
9 50M72646-7						3600	2000		
10 50M72646-9	Solder	Fixed	Spring	Beryllium Copper	100 Gold On 30 Nickel	4500	2500	500	100
(Continued)									

CHART III - 31. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
Kings										
Note 1										
<u>Jack Receptacle</u>										
1 F3510-175-00	$\frac{5}{16} \times 2 \frac{1}{16} \times \frac{3}{4}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Offset
2 F3510-225-00	$\frac{5}{16} \times 2 \frac{5}{16} \times \frac{3}{4}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Offset
3 F3510-275-00	$\frac{5}{16} \times 2 \frac{9}{16} \times \frac{3}{4}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Offset
4 F3510-325-00	$\frac{5}{16} \times 2 \frac{13}{16} \times \frac{3}{4}$	Glass Phenolic	None	None	One Row	Screws	Screws	Clamp Plate	None	Offset
Microdot										
5 "Micromate" Receptacle Series										
All plastic and metal components in the round wire "Micromate" connector series are intermountable and interchangeable with parts in the "Flexmate" FCC connector series. Contact Microdot for receptacle information.										
NASA										
Note 2										
<u>Bulkhead Receptacle</u>										
6 50M72646-1	0.80x2.13x1.74	Aluminum	Black Anodic Coating	For Series: Carried Through On Contact	Dual In-line	For Series - Locking: Clip. Safety: Lock- Wire	Screw	None	Yes, Epoxy Compound	For Series: Rectangular Keyway One Position
7 50M72646-3	0.80x2.58x1.74	Aluminum	Black Anodic Coating	For Series: Carried Through On Contact	Dual In-line	For Series - Locking: Clip. Safety: Lock- Wire	Screw	None	Yes, Epoxy Compound	For Series: Rectangular Keyway One Position
8 50M72646-5	0.80x3.11x1.74	Aluminum	Black Anodic Coating	For Series: Carried Through On Contact	Dual In-line	For Series - Locking: Clip. Safety: Lock- Wire	Screw	None	Yes, Epoxy Compound	For Series: Rectangular Keyway One Position
9 50M72646-7	0.88x3.71x1.74	Aluminum	Black Anodic Coating	For Series: Carried Through On Contact	Dual In-line	For Series - Locking: Clip. Safety: Lock- Wire	Screw	None	Yes, Epoxy Compound	For Series: Rectangular Keyway One Position
10 50M72646-9	0.88x4.16x1.74	Aluminum	Black Anodic Coating	For Series: Carried Through On Contact	Dual In-line	For Series - Locking: Clip. Safety: Lock- Wire	Screw	None	Yes, Epoxy Compound	For Series: Rectangular Keyway One Position
(Continued)										

Note 1: Depth measurement does not include screws.
Note 2: Dimensions are maximum.

CHART III - 31. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
Kings									
Jack Receptacle									
1	F3510-175-00	For Series: Gasket, Environ- mental, Silicone Rubber	None ↕ None	None ↕ None	Military And Commercial Uses For Series: Computers, Communications, Data Processing Equipment, Office Equipment Includ- ing Copiers, Aircraft	1 Year Production ↕ 1 Year Production	Series Is Designed To Applicable Specifications. Not Qualified At This Time	Type Flat To Flat Connections For Series: FCC To 0.032 In. Diameter Ribbon Cable. Receptacles can also be mated for round to round connections	
2	F3510-225-00								
3	F3510-275-00								
4	F3510-325-00								
Microdot									
5	"Micromate" Receptacle Series	All plastic and metal components in the round wire "Micromate" connector series are intermountable and interchangeable with parts in the "Flexmate" FCC connector series. Contact Microdot for receptacle information.							
NASA									
Bulkhead Receptacle									
6	50M72646-1	Refer To Mating Plug ↕ Refer To Mating Plug	None ↕ None	Not Applicable ↕ Not Applicable	Military And Aerospace ↕ Military And Aerospace	Series For NASA And Contractors As GFE	MIL-C-55544 ↕ MIL-C-55544	Type Connections: FCC To Round Wire	
7	50M72646-3								
8	50M72646-5								
9	50M72646-7								
10	50M72646-9								
(Continued)									

Note 1: GFE - Government Furnished Equipment.

CHART III - 32. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA: GENERAL (Physical Data Continued)						
Manufacturer And Part	Mating Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Maximum Resistance For Mated Connector (mΩ)	Overall Mated Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.) Or Round Wire AWG Size	Number Of Flat Cable Layers	Weight (g)
		IV-97											
		Plug											
1	50M72602-1	50M72607	300	3	500	10	0.88x0.88x1.44	6	0.075	See Mating Part	20 AWG Max	See Mating Part	8.5
2	50M72602-3	50M72607	300	3	500	10	1.00x1.00x1.44	12	0.075	See Mating Part	20 AWG Max	See Mating Part	18.0
		Plug											
3	50M72603-1	50M72606	300	3	500	10	1.00Dx1.44	6	0.075	See Mating Part	20 AWG Max	See Mating Part	9.2
4	50M72603-3	50M72606	300	3	500	10	1.38Dx1.44	12	0.075	See Mating Part	20 AWG Max	See Mating Part	19.5

CHART III - 32. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

PHYSICAL DATA: CONTACTS									
Identification: Manufacturer And Part	Conductor Termination	Removable Or Fixed Contacts	Type	Base Material	Finish, Material & Thickness (μ in.)	Maximum Connector Mating Force (g)	Maximum Connector Unmating Force (g)	Life Cycle: Number of Insertions	Individual Contact Force (g)
NASA (Con.)									
Receptacle, Bulkhead Sq. Flange Mount									
1 50M72602-1	For Both Series: Contacts Formed From Cable Conductors	Fixed	Sliding	Copper	100 Gold On 30 Nickel	400	200	500	133
2 50M72602-3		Fixed	Sliding	Copper	100 Gold On 30 Nickel	400	200	500	133
Receptacle, Bulkhead Single Hole Mount									
3 50M72603-1		Fixed	Sliding	Copper	100 Gold On 30 Nickel	800	400	500	133
4 50M72603-3		Fixed	Sliding	Copper	100 Gold On 30 Nickel	800	400	500	133

CHART III - 32. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

PHYSICAL DATA: ASSEMBLY										
Identification: Manufacturer And Part	Overall Unmated Dimensions: HxWxD Or DiaxL (in.)	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Locking And Safety Provisions	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Keying
NASA (Con.)										
Receptacle, Bulkhead Sq. Flange Mount										
1 50M72602-1	0.88x0.88x1.19	Aluminum	For Both Series: Con- ductive Pro- tective Coating	To Shell	Dual In-line	For Both Series: Shell Nut Safety Lock Wire	Screw	None	Yes, Epoxy	For Both Series: Rectangular Key- way, One Position
2 50M72602-3	1.00x1.00x1.19	Aluminum		To Shell	Dual In-line		Screw	None	Yes, Epoxy	
Receptacle, Bulkhead Single Hole Mount										
3 50M72603-1	1.00Dx1.19	Aluminum		To Shell	Dual In-line		Jam Nut	None	Yes, Epoxy	
4 50M72603-3	1.38Dx1.19	Aluminum		To Shell	Dual In-line		Jam Nut	None	Yes, Epoxy	

CHART III - 32. CONNECTORS: FLAT TO ROUND, RECEPTACLES ATTACHED TO ROUND WIRE

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
NASA (Con.)									
Receptacle, Bulkhead Sq. Flange Mount									
1 50M72602-1	For Series: Peripheral, Environ- mental, Sil- cone Rubber	-65 To +200	None	Not Applicable	Not Applicable	Military & Aerospace	For Both Series: NASA & Contrac- tors As GFE	MIL-C-55544	Type Connections For Both Series: FCC To FCC
2 50M72602-3		-65 To +200	None	Not Applicable	Not Applicable	Military & Aerospace		MIL-C-55544	
Receptacle, Bulkhead Single Hole Mount									
3 50M72603-1		-65 To +200	None	Not Applicable	Not Applicable	Military & Aerospace		MIL-C-55544	
4 50M72603-3		-65 To +200	None	Not Applicable	Not Applicable	Military & Aerospace		MIL-C-55544	

CHART III - 33. TRANSITIONS

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA (Continued)					
Manufacturer And Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Overall Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.), Round Wire AWG Size	Flat Cable Layer Number	Weight (g)	
AMP	IV-1											
1	Transition (AMP-UNYT Plug Or Receptacle)				AMP-UNYT plugs and receptacles, with and without mounting ears, described in charts entitled "Connectors: Flat To Flat," can be used as FCC to pc board transitions when solder tabs are substituted for pin and socket contacts. Only those differences occurring when items are used as transitions are noted here.							
	Berg	Note 1	Note 2	Note 2								
2	Transition, Universal Series	300	1	5000	2.1x0.2x1.4	17	0.050	1.0	0.002x0.025, AWG 32	1	No Data	
3		300			2.1x0.2x2.4	37	0.050	2.0	0.002x0.025, AWG 32			
4		300			2.1x0.2x3.4	57	0.050	3.0	0.002x0.025, AWG 32			
5	Transition, Universal Series	600			2.1x0.2x1.4	12	0.075	1.0	0.003x0.026, AWG 30			
6					2.1x0.2x2.4	25	0.075	2.0	0.003x0.026, AWG 30			
7			1		2.1x0.2x3.4	38	0.075	3.0	0.003x0.026, AWG 30			
8	Transition, Universal Series		3		2.1x0.2x1.4	9	0.100	1.0	0.003x0.062, AWG 26			
9			3		2.1x0.2x2.4	19	0.100	2.0	0.003x0.062, AWG 26			
10		600	3	5000	2.1x0.2x3.4	29	0.100	3.0	0.003x0.062, AWG 26	1	No Data	
	Burndy	Note 3			Note 4							
	Semi-Permanent Transition, TAPECON											
11	TE-10 -1	1000	1.5	For Series: Depends On FCC Insulation	1.12x1.72x0.84	17	0.050	1.0	For Series: 0.002x0.025, Round Wire Or PC Board	1	No Data	
12	TE-15 -1	1000	1.5		1.12x2.22x0.84	27	0.050	1.5		1	No Data	
13	TE-20 -1	1000	1.5		1.12x2.72x0.84	37	0.050	2.0		1	No Data	

Note 1: These transitions are in development. The in-house name applied to them as well as developmental FCC plugs and receptacles is "Universal Connectors."

Note 2: In process testing.

Note 3: Refer to last column, "Remarks," for type transitions. Item is also used as an FCC termination.

Note 4: The height was measured with wire wrap pins. If quick-disconnect terminals are used instead, the height will be 0.84. If solder dip pins are used, the height will be 0.70.

CHART III - 33. TRANSITIONS

PHYSICAL DATA								
Identification: Manufacturer And Part	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Mounting	Strain Relief Other Than Potting	Capacity For Potting And Recommended Material	Conductor Termination
AMP								
1	Transition, AMP-UNYT Plug Or Receptacle							
	AMP-UNYT plugs and receptacles, with and without mounting ears, described in charts entitled "Connectors: Flat To Flat," can be used as FCC to pc board transitions when solder tabs are substituted for pin and socket contacts. Only differences occurring when items are used as transitions are noted here.							
Berg								
2	Transition, Universal Series	None	None	In-line	Screw	For All Series: Provided By Housing	None	Force-fit
3								
4								
5	Transition, Universal Series							
6								
7								
8	Transition, Universal Series	None	None	In-line	Screw		None	Force-fit
9								
10								
Burndy								Note 1
Semi-Permanent Transition, TAPECON								
11	TE-10 ____ -1	For Series: Lower Housing Anodized With Elastomer Backing	None	Dual Staggered	Screw	For Series: Integral Assembly Pressure	None	FCC By Insulation Skiving, Round Wire By Wire Wrap Or Quick Disconnect, Board By Solder Dip
12	TE-15 ____ -1		None	Dual Staggered	Screw		None	
13	TE-20 ____ -1		None	Dual Staggered	Screw		None	

Note 1: Pins are available for wire wrap and solder dip connections. Additional terminals are available for quick disconnect connections. FCC can also be terminated using cable end slots.

CHART III - 33. TRANSITIONS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
AMP									
1 Transition (AMP-UNYT Plug Or Receptacle)		AMP-UNYT plugs and receptacles, with and without mounting ears, described in charts entitled "Connectors: Flat To Flat," can be used as FCC to pc board transitions when solder tabs are substituted for pin and socket contacts. Only differences occurring when items are used as transitions are noted here.							Type Transition: FCC To Printed Circuit Board.
Berg									
2 Transition, Universal Series	For Series: Encapsu- lated, See Housing Material	-60 To +150	None	Mechanical	Optional	Commercial Uses	Expected Production Date For All Series: 1971	None	Type Transition: FCC To Round Wire
3									
4									
5 Transition, Universal Series	For Series: Encapsu- lated, See Housing Material								
6									
7									
8 Transition, Universal Series	For Series: Encapsu- lated, See Housing Material	-60 To +150	None	Mechanical	Optional	Commercial Uses		None	
9									
10									
Burndy									
Semi-Permanent Transition, TAPECON									
11 TE-10 -1	None	No Data	Screwdriver	None	Optional	Typical For Series: Computers And Data Trans- mission Equipment	3rd Quarter 1971	For Series: Applicable Portions Of MIL-C-55544	Type Transitions: FCC To Round Wire By Wire Wrap Or Quick Dis- connect, FCC To Board By Solder Dip. Can be used as an end termi- nation or midspan tap.
12 TE-15 -1	None	No Data	Screwdriver	None	Optional		3rd Quarter 1971		
13 TE-20 -1	None	No Data	Screwdriver	None	Optional		3rd Quarter 1971		



CHART III - 34. TRANSITIONS

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA (Continued)				
Manufacturer And Part	Manufac- turer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Overall Dimensions: H×W×D Or Dia×L (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor T×W (in.) Round Wire AWG Size	Flat Cable Layer Number	Weight (g)
Kings											
IV-67											
1	Transition F2560-340-00	750	2	No Data	$\frac{5}{16} \times \frac{1}{2} \times \frac{13}{16}$	34	0.050	1.000	0.0025×0.025, AWG 22	2	30
2	F2560-341-00				$\frac{5}{16} \times \frac{1}{2} \times \frac{13}{16}$	34		1.000			30
3	F2560-440-00				$\frac{5}{16} \times \frac{5}{8} \times \frac{13}{16}$	44		1.250			35
4	F2560-441-00				$\frac{5}{16} \times \frac{5}{8} \times \frac{13}{16}$	44		1.250			35
5	F2560-540-00				$\frac{5}{16} \times \frac{9}{16} \times \frac{13}{16}$	54		1.500			40
6	F2560-541-00				$\frac{5}{16} \times \frac{9}{16} \times \frac{13}{16}$	54		1.500			40
7	F2560-640-00				$\frac{5}{16} \times \frac{13}{16} \times \frac{13}{16}$	64		1.750			45
8	F2560-641-00	750	2	No Data	$\frac{5}{16} \times \frac{13}{16} \times \frac{13}{16}$	64	0.050	1.750	0.0025×0.025, AWG 22	2	45
NASA											
IV-97											
9	Transition 50M72666-1	300	2	500	0.30×1.90×0.77	24	0.075	1.0	0.004×0.040 AWG 27	2	12
10	50M72666-3				0.30×2.40×0.77	36		1.5			15
11	50M72666-5				0.30×2.90×0.77	50		2.0			18
12	50M72666-7				0.30×3.40×0.77	64		2.5			21
13	50M72666-9				0.30×3.90×0.77	76		3.0	0.004×0.040, AWG 27		24
14	Transition 50M72676	300	2	500	0.33×3.26× $\frac{0.68}{0.62}$	64	0.075	2.5	0.003×0.050, AWG 27	2	22
(Continued)											

CHART III - 34. TRANSITIONS

PHYSICAL DATA								
Identification: Manufacturer And Part	Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Conductor Termination
Kings								
<u>Transition</u>								
1 F2560-340-00	Glass Phenolic	None	None	Dual In-line	Screw	Clamp Plate	None	Insulation Piercing
2 F2560-341-00								
3 F2560-440-00								
4 F2560-441-00								
5 F2560-540-00								
6 F2560-541-00								
7 F2560-640-00								
8 F2560-641-00	Glass Phenolic	None	None	Dual In-line	Screw	Clamp Plate	None	Insulation Piercing
NASA								
<u>Transition</u>								
9 50M72666-1	For Both Series: Molded-on, Epoxy Resin Compound	None	Terminated To Contact	Dual In-line	Screw	None	For Both Series: Totally Encap- sulated, Refer To Shell Material	Solder
10 50M72666-3								
11 50M72666-5								
12 50M72666-7								
13 50M72666-9								
<u>Transition</u>								
14 50M72676		None	Terminated To Contact	Dual In-line	Screw	None		Solder
(Continued)								

CHART III -34. TRANSITIONS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
Kings									
Transition									
1 F2560-340-00	None	-55 To +160	None	None Required	None	Military And Commercial Uses For Series: Computers, Com- munications, Data Processing, Office Equipment Including Copiers, Aircraft	No Schedule	Series Is Designed To Applicable Military Specifica- tions. Not Quali- fied At This Time.	Type Transition: FCC To Round Wire. 0.012 in. flat cable thickness for parts F2560-340-00, -440-, -540-, and -640-; 0.16 in. flat cable thick- ness for parts F2560-341-00, -441, -541, and -641-.
2 F2560-341-00									
3 F2560-440-00									
4 F2560-441-00									
5 F2560-540-00									
6 F2560-541-00									
7 F2560-640-00									
8 F2560-641-00	None	-55 To +160	None	None Required	None		No Schedule		
NASA									
Transition									
9 50M72666-1	For Both Series: Totally Encapsu- lated, Refer To Shell Material	-65 To +150	Mold Required	Mechanical Or Chemical	Tin Solder	Military And Aerospace	For Both Series: For NASA And Contractors As GFE	None	Type Transition For Part Series: FCC To Round Wire
10 50M72666-3									
11 50M72666-5									
12 50M72666-7									
13 50M72666-9									
Transition									
14 50M72676		-65 To +150	Mold Required	Mechanical Or Chemical	Tin Solder	Military And Aerospace		None	Type Transition: FCC To Round Wire
(Continued)									

Note 1: GFE: Government Furnished Equipment.



A

4



CHART III - 35. TRANSITIONS

IDENTIFICATION			ELECTRICAL DATA				PHYSICAL DATA				
Manufacturer And Part	Manufacturer's Data (Page)	Voltage Rating [V (rms)]	Current Rating (A)	Minimum Insulation Resistance (MΩ)	Overall Dimensions: HxWxD Or DiaxL (in.)	Contact Number	Contact Spacing, Center To Center (in.)	Flat Cable Width (in.)	Recommended Flat Conductor TxW (in.), Round Wire AWG Size	Flat Cable Layer Number	Weight (g)
1	NASA (Con.) Transition 50M72678	300	2	500	0.33x3.26x $\frac{0.68}{0.62}$	64	0.075	2.5	0.003x0.050, AWG 27	2	22
2	Thomas & Betts Note 1 Transition, Lug And Splice 675-53375-2	No Data	No Data	No Data	0.166 0.098 0.150 0.155x 0.093x 0.120	1	Not Applicable	Not Applicable	0.006x0.065, AWG 20	Not Applicable	No Data

Note 1: See last column, "Remarks," for information on use of this special transition device.

CHART III - 35. TRANSITIONS

Identification: Manufacturer And Part		PHYSICAL DATA							
		Housing Material	Housing Finish	Shield Termination	Configuration Of Contact Arrangement	Mounting	Strain Relief Other Than Potting	Capability For Potting And Recommended Material	Conductor Termination
1	NASA (Con.)								
	Transition 50M72678	Molded-on, Epoxy Resin Compound	None	Terminated To Contact	Dual In-line	Screw	None	Totally Encap- sulated, Refer To Shell Material	Solder
2	Thomas & Betts Note 1								
	Transition, Lug And Splice 675-53375-2	Copper	Tin	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Crimp

Note 1: See last column, "Remarks," for information on use of this special transition device.

CHART III - 35. TRANSITIONS

Identification: Manufacturer And Part	ENVIRONMENTAL DATA		SPECIAL ASSEMBLY AND INSTALLATION TOOLS	CABLE END PREP.		APPLICATIONS, COMMERCIAL AND MILITARY	AVAILABILITY	SPECIFICATIONS AND STANDARDS	REMARKS
	Seal And Material	Temperature Range (°C)		Strip Method	Recom- mended Conductor Finish				
1	NASA (Con.) Transition 50M72678	-65 To +150	Mold Required	Mechanical Or Chemical	Tin Solder	Military And Aerospace	For NASA And Contractors As GFE	None	Type Transitions: FCC To Round Wire
2	Thomas & Betts Transition, Lug And Splice 675-53375-2	No Data	See Note	See Note	Tin	See Note	No Data	MIL-T-7928	This lug and splice transition item is designed to join a flat conductor with round stranded wire. Using a number of these lugs and a suitable potting material it is possible to form a molded tran- sition (with tooling provided by the designer).

Note 1: GFE - Government Furnished Equipment.

Note 2: See last column, "Remarks," for information on use of this special transition device.



SECTION IV. MANUFACTURERS' DATA



A

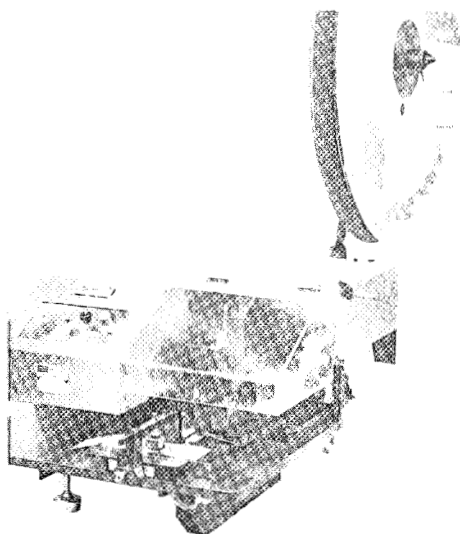
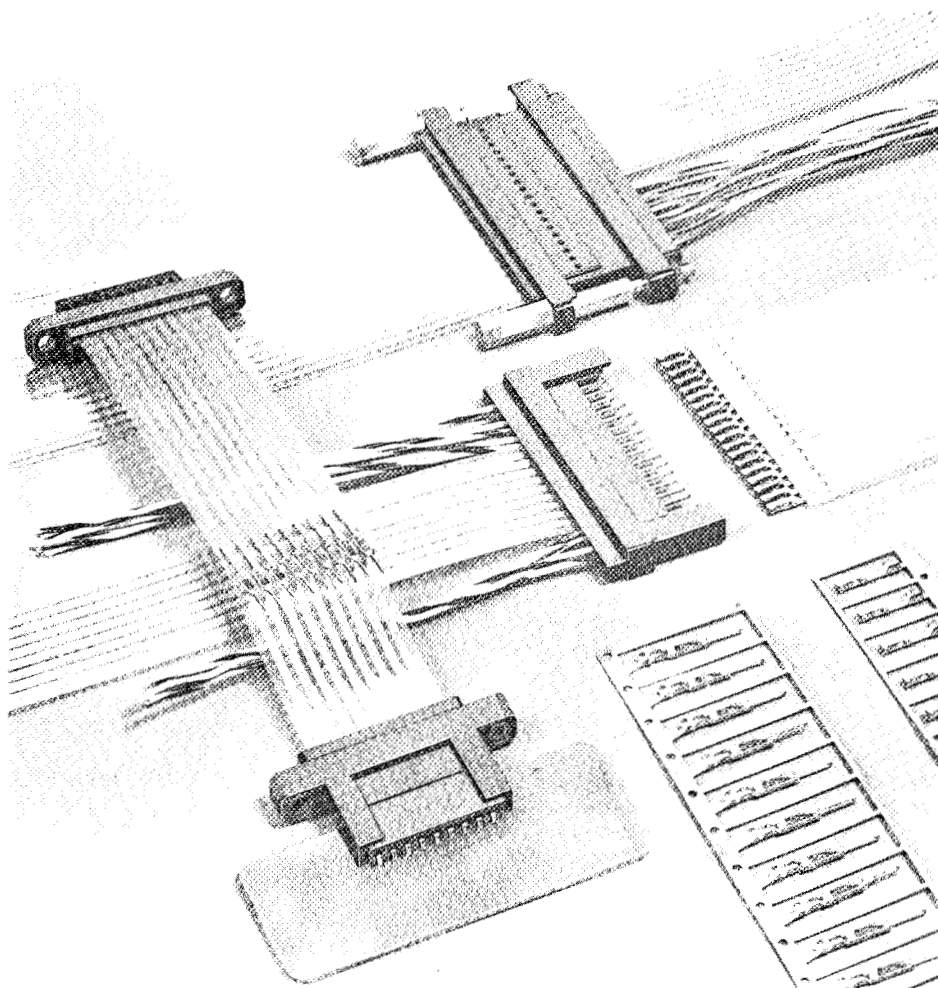
W



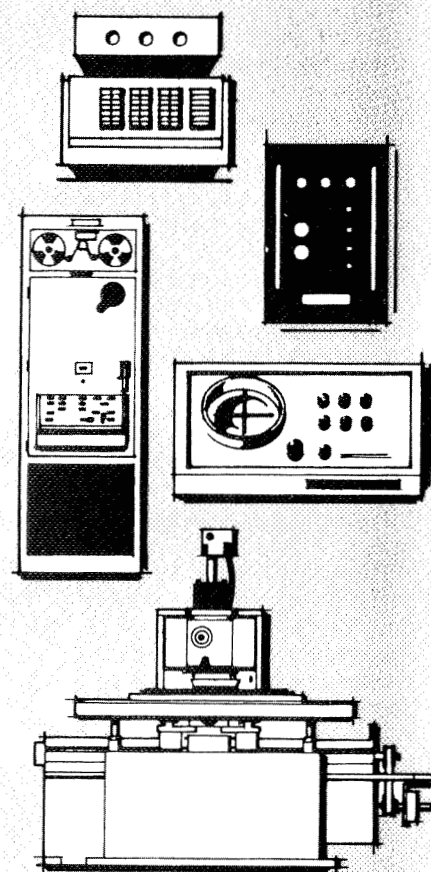
AMP



AMP-UNYT Flexible Flat Cable Connector



Complementing AMP's complete line of Flexible Flat Cable Connectors is the AMP-O-MATIC* Flexible Flat Cable Terminating Machine — the industry's first fully automatic machine for the termination of flexible flat cable. Offering speed and economy, this versatile machine completely eliminates the need for expensive and time consuming special cable preparations. Reel-fed, stamped and formed contacts are automatically applied to the flat cable at rates of two contacts per second in one continuous action. The operator simply positions the cable and presses the start button. The machine automatically displaces the insulation, crimps the contact to the cable and makes positive contact to the conductor with excellent electrical and mechanical characteristics.



Flexible Flat Cable Connectors

AMP continues to expand its industry use — proven crimp termination technology by providing the first automatic machine crimp application for flexible flat cable. The AMP-UNYT Flexible Flat Cable Connector combines the industry demand features of functional application and applied cost savings.

This technique eliminates the need for special and costly cable preparation, stripping and conductor plating. It also removes the inherent dangers of heat damage from solder or weld techniques.

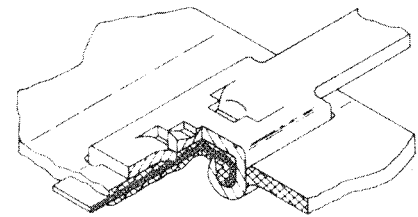
Basically, the AMP crimp termination technique uses stamped and formed contacts which are automatically crimped onto the cable conductor. During the crimping process the contact penetrates the insulation on both sides of the conductor, and then is folded over to grip and force the insulated conductor into the wire barrel area of the contact. At this point in the application the insulation is displaced from the conductor and positive contact is made with the flat conductor. This results in a termination with excellent electrical and mechanical characteristics.

The .025 x .025 pin contact and mating receptacles are available with gold over nickel plating and accept cable with .060" / .065" wide conductors on .100" centers per NAS729, IPC-FC-220 and MIL-C-55543. Solder tab contacts for making permanent solder terminations to printed circuit boards are available in either gold over nickel plating or tin plating.

The AMP-UNYT Flexible Flat Cable Connector is available in 9, 19, 29, 33 and 38 positions, male and female, with or without mounting ears.

This versatile connector mates with a number of A-MP* Connectors including AMPMODU* Connectors.

The AMP-O-MATIC Automatic Flexible Flat Cable Terminating Machine applies contacts to the cable in one continuous action. The operator simply positions the cable in the alignment fixture, which is part of the machine, and then presses the start button. Speed of application and the reliability of the terminations provide you with overall applied cost savings.



Illustrated, above, is a cross sectional view of the AMP-UNYT flexible flat cable contact showing the high performance insulation displacing technique. This termination is accomplished by the legs on the contact penetrating the insulation on both sides of the conductor and folding over to grip and force the insulated conductor up into the wire barrel where the insulation displacing lances make positive contact with the conductor.

Contact Specifications

Electrical Characteristics:

- Contact Current Rating:
3 amperes continuous
- Operating Temperature:
-65°C to +125°C

Performance:

- High Potential: 1,200 VAC RMS
- Insulation Resistance: 5,000 megohms minimum between contacts

All Dimensions in Inches

Features

Automatic crimp on, snap-in contacts.

Crimp technique displaces insulation for excellent electrical contact.

Reliable electrical and mechanical characteristics.

Eliminates cable stripping and conductor plating requirements.

No heat applied to crimp-type contacts.

Easy connector maintenance.

Choice of pin contacts, receptacles or printed circuit board solder tabs.

Capability of intermixing flat cable and round wire conductors in the same housing.

Choice of 9, 19, 29, 33 and 38 position housings.

Terminates conductors on .100" centers with .060" / .065" wide conductors per NAS-729, IPC-FC-220 and MIL-C-55543.

Connectors available for cable to cable, cable to board, cable to .025 x .025 AMPMODU posts, daisy chain, and cable to wire applications.

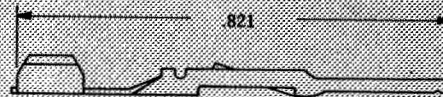
Automatic machine crimp on contact applications for lower applied cost.

Solder tab contacts for permanent printed circuit board terminations are available. Choice of gold over nickel or tin plating.

Pin
Contacts

Receptacle
Contacts

Solder Tab



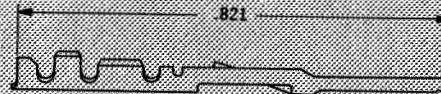
For Flexible Flat Conductor Cable Terminations

(.060" / .065" wide conductors on .100" min. centers,
.015" max. total cable thickness)

Material: Phosphor Bronze

Part Nos.: 86556-4*
86556-6**

NOTE: All contacts are in strip form for recommended AMP-O-MATIC flexible flat cable machine application.

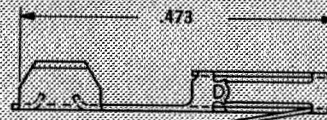


For 24-22 AWG Wire Size Terminations

(.040"-.056" dia. insulation range)

Material: Phosphor Bronze

Part Nos.: 86557-6*
86557-4**



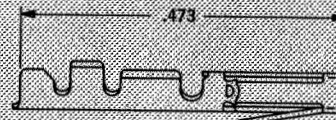
For Flexible Flat Conductor Cable Terminations

(.060" / .065" wide conductors on .100" min. spacing,
.015" max. total thickness)

Material: Phosphor Bronze

Part Nos.: 86565-2*
86565-4**

NOTE: All contacts are in strip form for recommended AMP-O-MATIC flexible flat cable machine application.

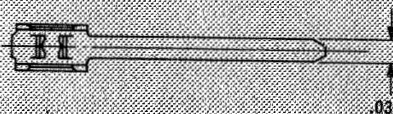
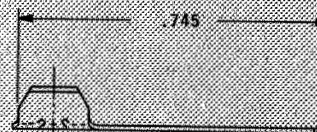


For 24-22 AWG Wire Size Terminations

(.040"-.056" dia. insulation range)

Material: Phosphor Bronze

Part Nos.: 86566-2*
86566-4**



For Flexible Flat Conductor Cable Termination

(.060" / .065" wide conductors on .100" min. spacing,
.015" max. total thickness)

Material: Phosphor Bronze

Part Nos.: 86574-2, .000030 Gold over .000030 Nickel
86574-3, .000010 Bright Tin

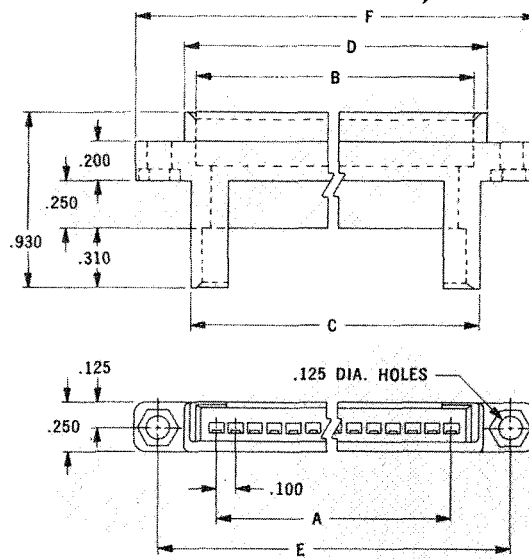
NOTE: All contacts are in strip form for recommended AMP-O-MATIC flexible flat cable machine application.

*Gold Flash over .000030 Nickel Entire Contact,
.000015 Gold on Contact Area only.

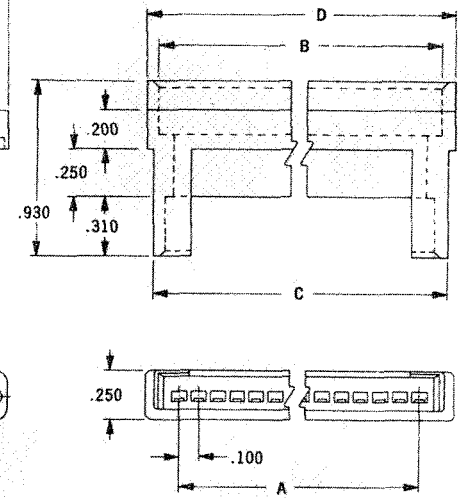
**Gold Flash over .000030 Nickel Entire Contact,
.000030 Gold on Contact Area only.

**9, 19, 29 and 33 Position
(Single Row)**

**Pin Connector
with Mounting Ears**

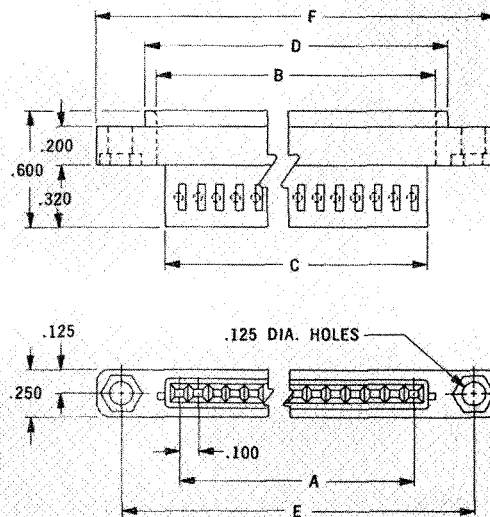


**Pin Connector
without Mounting Ears**

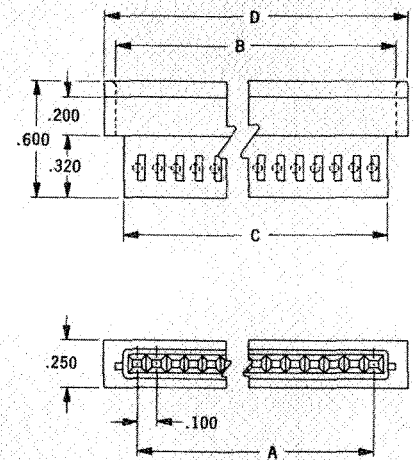


**9, 19, 29 and 33 Position
(Single Row)**

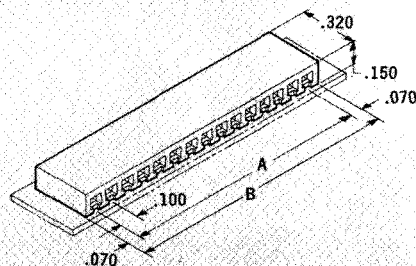
**Receptacle Connector
with Mounting Ears**



**Receptacle Connector
without Mounting Ears**



Single Row Contacts

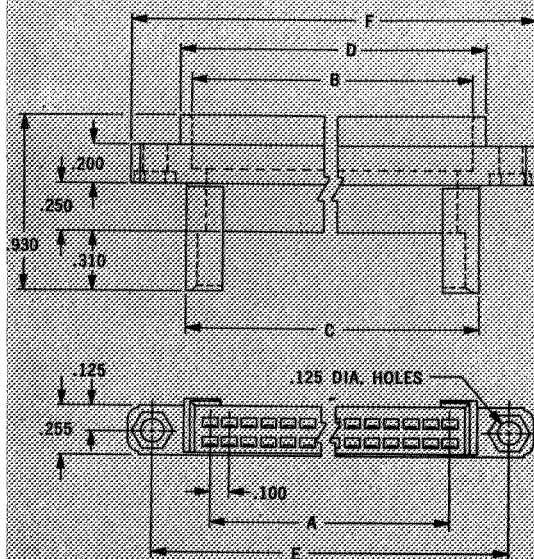


AMPMODU Receptacle
Connectors for
P.C. Applications

NOTE: Additional sizes between 9 and 33 positions can be made available. Consult AMP Incorporated.

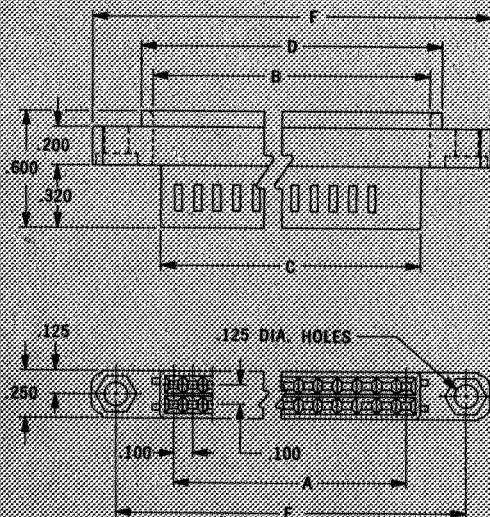
**38 Position
(Double Row-19
Contacts per Row)**

**Pin Connector
with Mounting Ears**

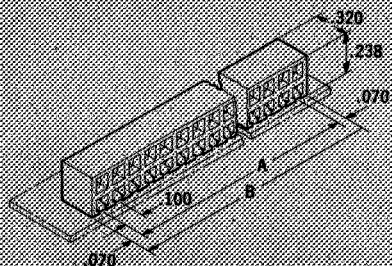


**38 Position
(Double Row-19
Contacts per Row)**

**Receptacle Connector
with Mounting Ears**



Double Row Contacts



9, 19, 29 and 33 Position

Pin Connectors with Mounting Ears

No. of Positions	Part Number	A	B	Dimensions C	D	E	F	Extraction Tool
9	86562-3	.800	1.026	1.080	1.150	1.410	1.660	91047-1
19	86562-4	1.800	2.026	2.080	2.150	2.410	2.660	91047-2
29	86562-2	2.800	3.026	3.080	3.150	3.410	3.660	91047-3
33	86562-1	3.200	3.426	3.480	3.550	3.810	4.060	91047-4

Housing Material: Polysulfone

Pin Connectors without Mounting Ears

No. of Positions	Part Number	A	Dimensions B	C	D	Extraction Tool
9	86555-2	.800	1.026	1.080	1.150	91047-1
19	86555-1	1.800	2.026	2.080	2.150	91047-2
29	86555-3	2.800	3.026	3.080	3.150	91047-3
33	86555-4	3.200	3.426	3.480	3.550	91047-4

Housing Material: Polysulfone

38 Position Double Row

Pin Connectors with Mounting Ears

No. of Positions	Part Number	A	B	Dimensions C	D	E	F	Extraction Tool
38	86577-3	1.800	2.034	2.080	2.150	2.410	2.660	91407-2

Housing Material: Diethyl Phthalate

9, 19, 29 and 33 Position

Receptacle Connectors With Mounting Ears

No. of Positions	Part Number	A	B	Dimensions C	D	E	F	Extraction Tool
9	86563-1	.800	1.034	.940	1.150	1.410	1.660	91048-1
19	86563-2	1.800	2.034	1.940	2.150	2.410	2.660	91048-2
29	86563-3	2.800	3.034	2.940	3.150	3.410	3.660	91048-3
33	86563-4	3.200	3.434	3.340	3.550	3.810	4.060	91048-4

Housing Material: Polysulfone

Receptacle Connectors Without Mounting Ears

No. of Positions	Part Number	A	Dimensions B	C	D	Extraction Tool
9	86572-1	.800	1.034	.940	1.150	91048-1
19	86572-2	1.800	2.034	1.940	2.150	91048-2
29	86572-3	2.800	3.034	2.940	3.150	91048-3
33	86572-4	3.200	3.434	3.340	3.550	91048-4

Housing Material: Polysulfone

38 Position Double Row

Receptacle Connectors With Mounting Ears

No. of Positions	Part Number	A	B	Dimensions C	D	E	F	Extraction Tool
38	86578-3	1.800	2.034	1.940	2.150	2.410	2.660	91048-2

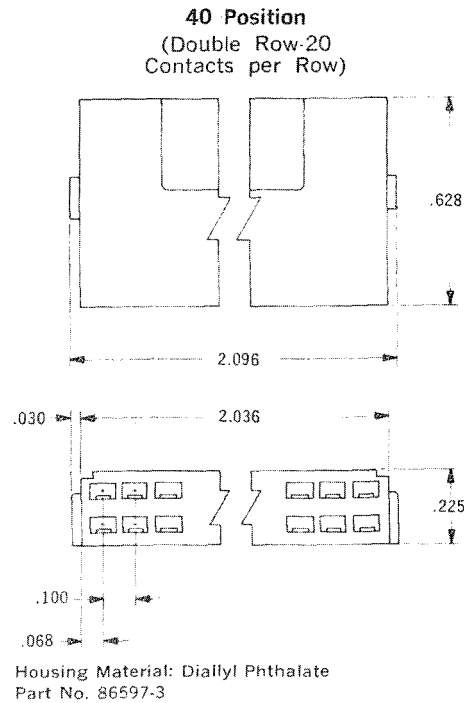
Housing Material: Diethyl Phthalate

AMPMODU Mod. II Receptacle Connectors

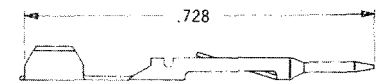
No. of Positions	Diethyl Phthalate Housings	Phenolic Housings	Dimensions A	B
9	5-85928-7	5-86105-7	.800	.940
19	1-85928-1	1-86105-0	1.800	1.940
38 (Double Row)	1-85930-3	1-86063-5	1.800	1.940
29	2-85928-1	2-86105-0	2.800	2.940
33	2-85928-5	2-86105-4	3.200	3.340

NAFI Insert and Tooling Information

NAFI Insert and Pin Contacts



Pin Contacts

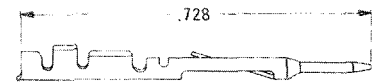


For Flexible Flat Conductor Cable Terminations

(.060"-.065" wide conductors on .100" min
centers, .015" max. total cable thickness)

Material: Phosphor Bronze

Part No.: 86598-2, gold flash over .000030
nickel entire contact, .000050 gold on
contact area only



For 24-22 AWG Wire Size Terminations

(.040"-.056" dia. insulation range)

Material: Phosphor Bronze

Part No. 86599-2, gold flash over .000030
nickel entire contact, .000050 gold on
contact area only

Hand Tools and Hardware



CERTI-CRIMP Hand Tool
for Termination of
round wire

Part No. 90222-1



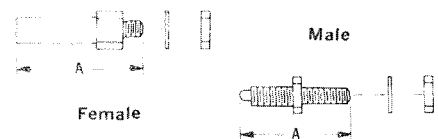
CERTI-CRIMP Hand Tool
for Termination of flexible
flat cable

Part No. 90236-1

(The use of this hand tool is recommended
for prototype work, replacement and repair.)

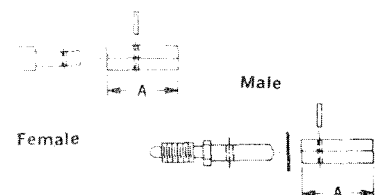
Jackscrews

FIXED



Part No.	Type	Material	A
200874-1	Male	Stain. Steel	.815
200874-2	Male	Cd. Pl. Steel	.815
86582-1	Female	Cd. Pl. Steel	.972
86602-1	Female	Stain. Steel	1.095

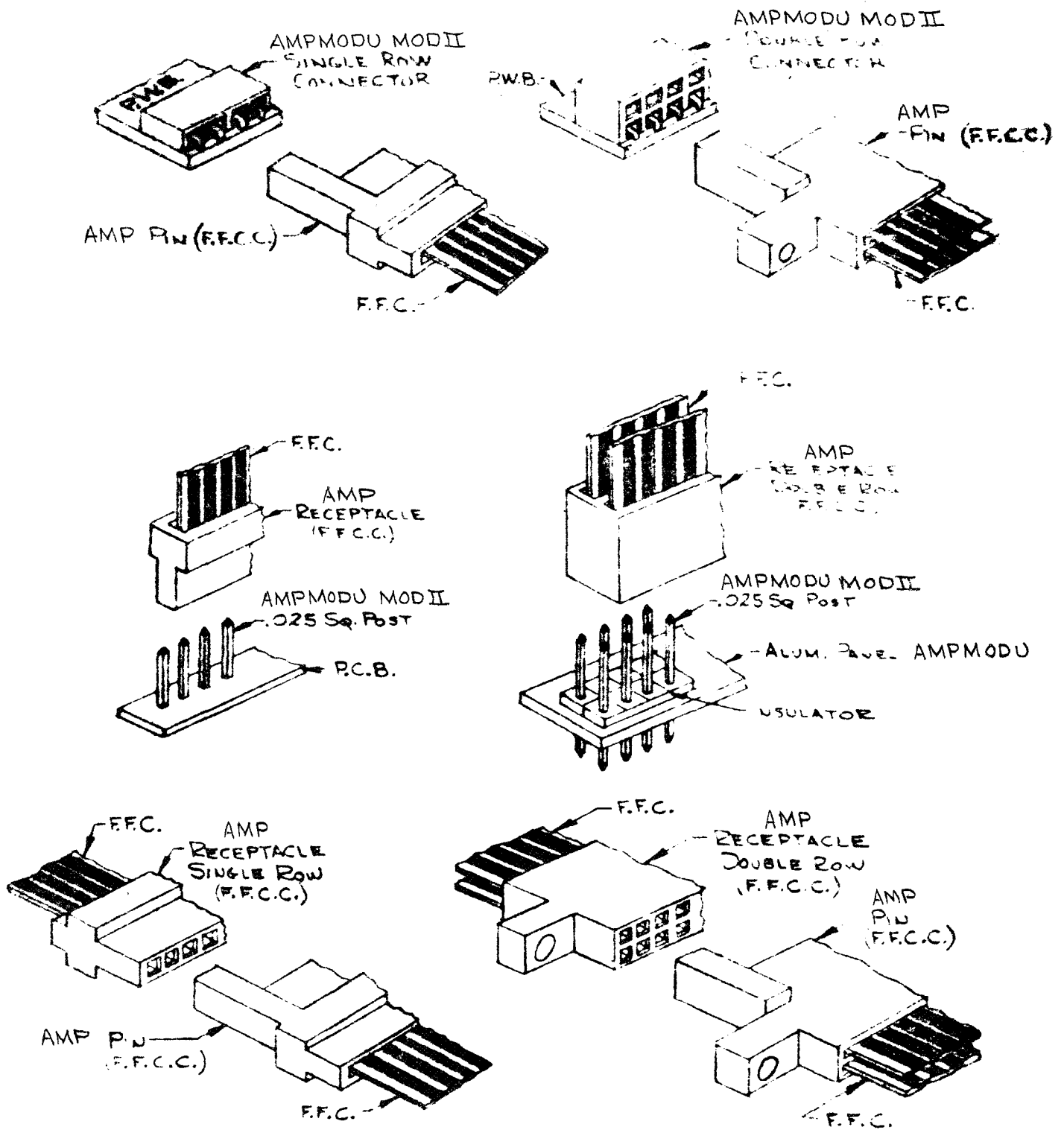
SHORT-SHORT TURNABLE

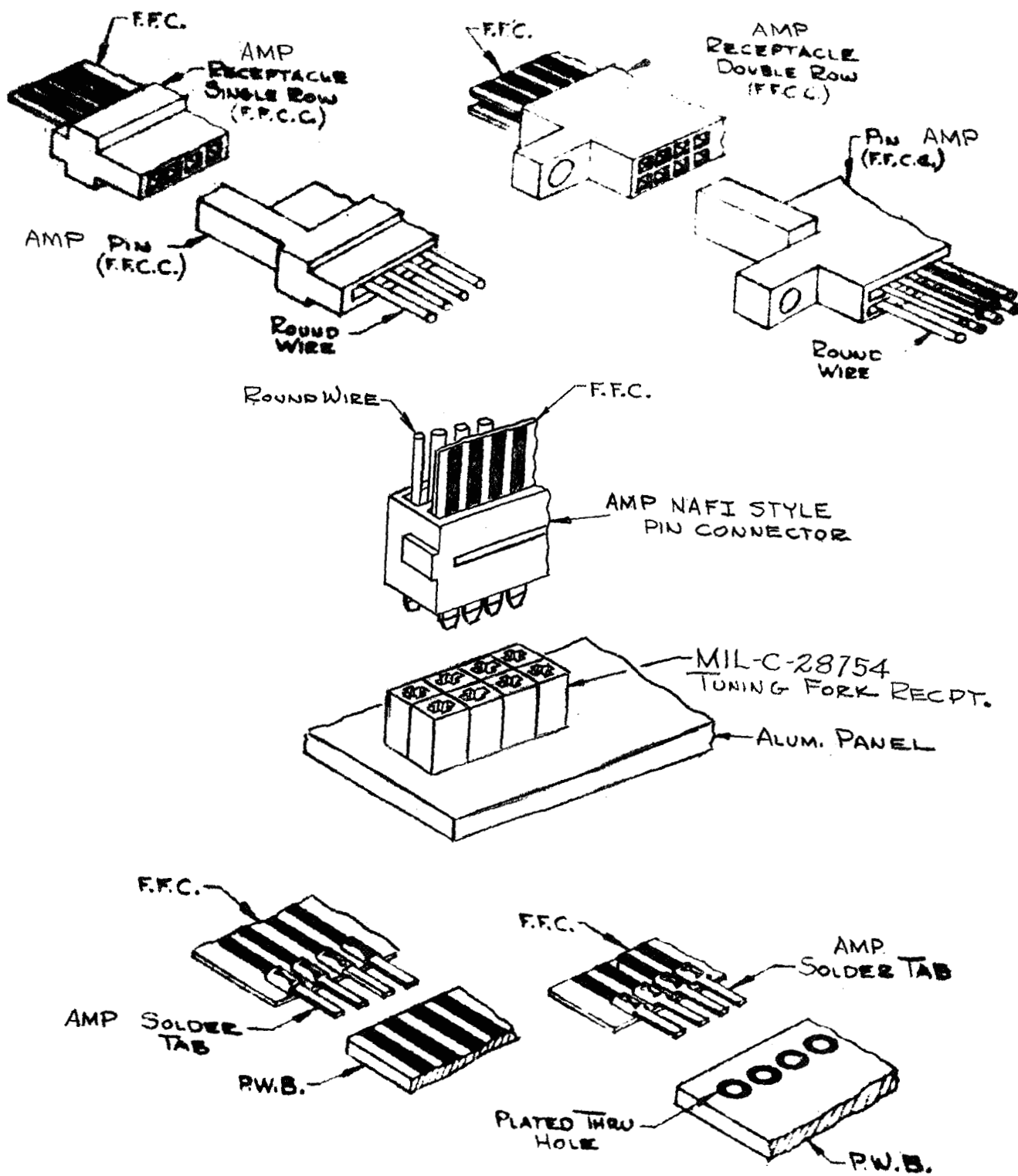


Part. No.	Type	Material	A
201388-1	Male	Stain. Steel	.562
201388-2	Male	Cd. Pl. Steel	.562
86603-1	Female	Stain. Steel	.562
86581-1	Female	Cd. Pl. Steel	.562

INCORPORATED
HARRISBURG, PENNSYLVANIA 17105
Phone: 717-564-0101 TWX: 510-657-4110

FLEXIBLE FLAT CABLE APPLICATIONS





PRODUCT SPECIFICATION FLEXIBLE FLAT CABLE CONNECTOR

108-9,024

NUMBER

AMP SECURITY
CLASSIFICATION Customer Release

1. SCOPE:

This specification establishes the physical and performance requirements for the FLEXIBLE FLAT CABLE CONNECTOR and describes the testing and quality assurance provisions applicable to product manufactured to this specification.

Product Configuration - The connectors covered by this specification are of two basic types described below.

TYPE I - Flat cable to flat cable utilizing crimp type contacts, box shaped pin and sockets, retained in molded plastic housings.

TYPE II - Flat cable to printed wiring boards - utilizing crimp-snap in receptacle or pins on the tape cable and AMP MODU MOD II receptacles or posts mounted to the printed wiring board

2. REFERENCE DOCUMENTS:

The following documents form a part of this specification to the extent referenced herein:

2.1 MILITARY AND FEDERAL SPECIFICATIONS -

MIL-M-14F	Molding Material Thermo Setting
MIL-I-45208	Inspection System Requirements
MIL-P-46120	Plastic Molding and Extrusion Material, Polysulfone
MIL-G-45204	Gold Plating; Electrodeposited
MIL-W-16878	Wire, Electrical, Insulated, Copper
QQ-B-750	Phosphor Bronze
QQ-N-290	Nickel Plating; Electrodeposited

2.2 AMP SPECIFICATIONS -

109-1	Definitions of Terms and Methods used in AMP Test Specifications
109-3	Millivolt Drop Method for Measuring Resistance

2.3 MILITARY STANDARDS

MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
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DR
CHK
APP

AMP

AMP INCORPORATED
HARRISBURG, PENNA.

LOC **A** NO 108-9,024

REV **A**

SHEET
1 OF 16

NAME
PRODUCT SPECIFICATION
FLEXIBLE FLAT CABLE CONNECTOR

MIL-STD-105

Sampling Procedures and Tables for Inspection
by Attributes

2.4 OTHER DOCUMENTS -

ASTM-B-103
NAS 729

Phosphor Bronze
Cable, Electrical, Flat Conductor, Flexible

3. DESIGN REQUIREMENT:

3.1 PHYSICAL CHARACTERISTICS AND MATERIAL - The dimensions of all components that are parts of the connector assembly shall meet the requirements contained on the applicable drawings. Materials and finishes used shall be as specified in the following paragraphs. Substitute materials and finishes may be authorized only after the performance of the substitute has been demonstrated and shall be capable of meeting the requirements of this specification.


3.1.1 HOUSINGS - The housings shall be fabricated from Polysulfone or Diallyl Phalate material conforming to MIL-P-46120 or MIL-M-14-F-SDGF.

3.1.2 CONTACTS - The contacts shall be fabricated from phosphor bronze conforming to QQ-B-750.

3.1.3 CONTACT PLATING - The contacts shall be plated gold over nickel to the thickness specified on the applicable drawing. The gold plating shall conform to MIL-G-45204 and nickel plating to QQ-N-290.

3.2 PERFORMANCE AND ENVIRONMENTAL RATINGS - The flexible flat cable connector shall meet the following ratings when exposed to environmental stress of this specification.

3.2.1 Temperature- Current -Rating - The connectors are rated for continuous operation at an upper temperature limit of $+85^{\circ}\text{C}$ and a lower temperature limit of -55°C . Ambient temperature conditions and current loading of contacts shall be considered in determining whether these limits are exceeded. Typical Temperature rise characteristics; at an ambient temperature of


SHEET				AMP INCORPORATED HARRISBURG, PENNA.	
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NAME		REV A			
PRODUCT SPECIFICATION FLEXIBLE FLAT CABLE CONNECTOR					

25.6°C a current of 3 amperes through all contacts of a 19 position plug mated with a AMPMODU MOD II receptacle creates a connector assembly housing temperature of 65°C.

- 3.2.2 CURRENT RATING - 3 Amperes.
- 3.2.3 INSULATION RESISTANCE - Greater than 1,000 megohms.
- 3.2.4 TERMINATION RESISTANCE - 25 Milliohms - maximum.
- 3.2.5 INDIVIDUAL CONTACT RETENTION - 10 Pounds - minimum.
- 3.2.6 TOTAL MATING FORCE PER CONTACT - 5.0 ounces maximum.
- 3.2.7 SEPARATION FORCE PER CONTACT - .75 ounce minimum.
- 3.2.8 DIELECTRIC STRENGTH (SEA LEVEL) - 1200 VAC (Test Voltage).
- 3.2.9 DURABILITY- 500 Cycles (Gold).
- 3.2.10 MAINTENANCE AGING - 10 Contact Insertion-Extractions.
- 3.2.11 THERMAL SHOCK - MIL-STD-202, Method 107, Condition A -55° - +85°C.
- 3.2.12 VIBRATION - MIL-STD-202, Method 201 (10-55 CPS).
- 3.2.13 PHYSICAL SHOCK - MIL-STD-202, Method 205, Condition B (30 G)
- 3.2.14 MOISTURE RESISTANCE - MIL-STD-202, Method 106 (Delete Step 7b)
- 3.2.15 SALT SPRAY - MIL-STD-202, Method 101, Condition 48 hr @20%.


4. TEST REQUIREMENTS AND METHODS:

- 4.1 TEST ENVIRONMENTS AND CONDITIONS - Unless specifically stated, tests and examinations required by this specification shall be conducted under any combination of conditions within the following ranges:

SHEET				AMP INCORPORATED HARRISBURG, PENNA.	
3 OF 16	LOC	A	NO.	108-9,024	REV
NAME		A			
PRODUCT SPECIFICATION FLEXIBLE FLAT CABLE CONNECTOR					

Temperature: 20° to 30°C
Relative Humidity: 30 to 80 percent
Barometric Pressure: 24 to 31 inches of mercury

- 4.2 TEST MEASUREMENTS - Whenever possible, all testing shall be conducted in a manner which yields variables data. Unless otherwise specified, a minimum of 30 random measurements shall be recorded.
- 4.3. EXAMINATION OF PRODUCT - Before, during and after testing the test operator shall visually examine hardware, to note and record original and changed characteristics with respect to; surface finish, texture, or cracks, etc. Changes in physical characteristics beyond drawing and/or specification allowances shall be considered a test failure.
- 4.4 TOTAL MATING FORCE - When tested in accordance with Paragraph 4.4.1, the mating force per contact shall not exceed 5.0 ounces.
- 4.4.1 TOTAL MATING FORCE - The force to mate the connector halves shall be measured and recorded. The force shall be determined by dividing the total mating force by the number of loaded contact positions. The measured values shall meet the requirements of Paragraph 4.4.
- 4.5 TERMINATION RESISTANCE (LOW LEVEL) - When tested in accordance with Paragraph 4.5.1, the resistance of mated pairs of contacts shall not exceed 25 milliohms.
- 4.5.1 TERMINATION RESISTANCE (LOW LEVEL) - The resistance of individual mated pairs of contacts shall be measured as shown in Figure 2 in accordance with AMP Test Specification 109-3. The test current shall not exceed 1.0 milliamps D.C. and the open circuit voltage shall not exceed 20 millivolts. The measurements shall meet the requirements of Paragraph 4.5.
- 4.6 TERMINATION RESISTANCE (RATED CURRENT) - When tested in accordance with Paragraph 4.6.1, the resistance of mated pairs of contacts shall not exceed 25 milliohms.
- 4.6.1 TERMINATION RESISTANCE (RATED CURRENT) - The resistance of individual mated pairs of contacts shall be measured between the points shown in Figure 2 in accordance with Method 307 of MIL-STD-202. Each mated pair of contacts shall be energized

SHEET				AMP INCORPORATED HARRISBURG, PENNA.	
4 OF 16		LOC	A	NO.	108-9,024
NAME		PRODUCT SPECIFICATION FLEXIBLE FLAT CABLE CONNECTOR			
		REV		A	

separately with 3 amperes (A.C.). Measurements shall be taken after the temperature of the contacts has stabilized and shall meet the requirements of Paragraph 4.6.

- 4.7 CONTACT SEPARATION FORCE - When tested in accordance with Paragraph 4.7.1, the separation force per contact shall not be less than 0.75 ounces.

4.7.1 CONTACT SEPARATOR FORCE - The force to unmate the gauge pin shown in Figure 3 shall be measured and recorded. The measured force per contact shall meet the requirements of Paragraph 4.7.

- 4.8 INSULATION RESISTANCE - When tested in accordance with Paragraph 4.8.1, the insulation resistance shall not be less than 5,000 megohms and after environmental exposure shall not be less than 1,000 megohms.

4.8.1 INSULATION RESISTANCE - The unmated flat cable plug connector shall be tested in accordance with Method 302, Test Condition B of MIL-STD-202. The measurements shall be made between random adjacent pairs of contacts and the measurements shall meet the requirements of Paragraph 4.8.


- 4.9 DIELECTRIC STRENGTH - When tested in accordance with Paragraph 4.9.1, the flat cable plug connectors shall show no evidence of breakdown or flashover when the voltages specified in Table 1 are applied.

4.9.1 DIELECTRIC STRENGTH - The unmated flat connector halves shall be tested in accordance with Method 301 of MIL-STD-202 at the voltages and simulated altitudes shown in Table 1. The voltages shall be applied between all adjacent contacts at a rate not exceeding 500 volts per second until the applicable voltage of Table 1 is reached. The specified voltage shall be maintained for one minute. (See 4.9)


TABLE 1

DIELECTRIC STRENGTH

ALTITUDE (FEET)	VOLTAGE (AC RMS)
Sea Level	1,200
25,000	800
50,000	550

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- 4.10 MAINTENANCE AGING - When tested in accordance with Paragraph 4.10.1, the contacts shall withstand a 10 pound axial load.
- 4.10.1 MAINTENANCE AGING - The crimped contacts shall be inserted and extracted thru ten (10) insertions, after the tenth insertion the contacts shall then be subjected to an axial load of ten pounds applied to the contact in a direction opposite that of insertion without dislodging per paragraph 4.10.
- 4.11 THERMAL SHOCK - When tested in accordance with Paragraph 4.11.1, there shall be no evidence of physical damage and connector shall be capable of meeting subsequent tests in Table II.
- 4.11.1 THERMAL SHOCK - The mated assemblies shall be subjected to temperature cycling in accordance with Method 107, Condition A of MIL-STD-202. The assemblies shall meet the requirements of Paragraph 4.11.
- 4.12 DURABILITY - When tested in accordance with Paragraph 4.12.1, the assemblies shall show no evidence of mechanical damage and shall be capable of meeting subsequent tests in Table II.
- 4.12.1 DURABILITY - The assemblies shall be subjected to 500 cycles of mating and unmating at a rate not exceeding 500 cycles per hour. The cycling shall be conducted in a manner which simulates service. After cycling, the assemblies shall meet the requirements of Paragraph 4.12.
- 4.13 VIBRATION - When tested in accordance with Paragraph 4.13.1 the assemblies shall show no evidence of cracking, breaking, loosening of parts, nor loss of continuity of any contact circuit greater than one microsecond.
- 4.13.1 VIBRATION - The mated assemblies shall be tested in accordance with Method 201 of MIL-STD-202. The assemblies shall be rigidly attached to the vibration fixture. The cable shall be secured to the vibration fixture as shown in Figure 4 or 5. All contacts shall be series wires and connected to a suitable testing

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circuit with 0.1 ampere flowing through the contacts.
The assemblies shall meet the requirements of Paragraph 4.13.

4.14 SHOCK - When tested in accordance with Paragraph 4.14.1, the assemblies shall show no evidence of cracking, breaking, loosening of parts, nor loss of continuity of any contact circuit greater than one microsecond.

4.14.1 SHOCK - The mated assemblies shall be tested in accordance with Method 205, Condition B of MIL-STD-202. All contacts shall be series wired and connected to a suitable testing circuit with 0.1 ampere flowing through the contacts. The shock test shall be repeated 3 times in both directions of the referenced 90° axis planes (a total of 18 drops). The assemblies shall meet the requirements of Paragraph 4.14.

4.15 MOISTURE RESISTANCE - When tested in accordance with Paragraph 4.15.1, the assemblies shall meet the subsequent tests of Table II.


4.15.1 MOISTURE RESISTANCE - The unmated assemblies shall be tested in accordance with Method 106 of MIL-STD-202, except that Step 7b is not required. Following exposure, the assemblies shall meet the requirements of Paragraph 4.15.

4.16 SALT SPRAY - When tested in accordance with Paragraph 4.16.1, the assemblies shall meet the subsequent tests of Table II.

4.16.1 SALT SPRAY - The unmated assemblies shall be subjected to the salt spray test in accordance with Method 101, Condition B, 20% of salt solution shall be used, of MIL-STD-202. Following the cleaning operation at the end of the exposure period, the assemblies shall be dried in a circulating air oven for a maximum of 12 hours at $38^{\circ} \pm 3^{\circ}\text{C}$. The mated assemblies shall meet the requirements of Paragraph 4.16.

4.17 TEMPERATURE LIFE - When tested in accordance with Paragraph 4.17.1, the mated assemblies shall meet the requirements of Paragraph 4.8 and subsequent tests of Table II.

4.17.1 TEMPERATURE LIFE - The mated assemblies shall be tested in accordance with Method 108, Condition B of MIL-STD-202, at a temperature of $85 \pm 2^{\circ}\text{C}$. When the assemblies have returned to room temperature they shall meet the requirements of Paragraph 4.17.

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4.18 **CONTACT RETENTION** - When tested in accordance with Paragraph 4.18.1, the contact retention shall not be less than 10 pounds.

4.18.1 **CONTACT RETENTION** - The force to dislodge the contacts shall be measured and recorded. The load shall be applied to the contacts from the mating face at approximately 2 pounds per second. The force value shall meet the requirements of Paragraph 4.18.

4.19 **CONTACT CRIMP STRENGTH** - When tested in accordance with Paragraph 4.19.1, the strength of the crimp shall not be less than the following values:

FLAT CABLE	5 Pounds
# 22 Wire	11 Pounds
# 24 Wire	7 Pounds


4.19.1 **CONTACT CRIMP STRENGTH** - The contacts shall be placed in a standard tensile testing machine and an axial load shall be applied at a rate of one inch per minute. The holding surface or clamps of the testing machine may be serrated to provide sufficient gripping or holding strength. The contacts shall meet the requirements of Paragraph 4.19.

5. QUALITY ASSURANCE PROVISIONS:

5.1 **GENERAL REQUIREMENTS** - This section of the specification defines the tests and inspections required to demonstrate the ability of the **FLEXIBLE FLAT CABLE CONNECTOR** product to comply with the requirements of this specification.

5.2 **QUALIFICATION TEST** - Product conformance shall be demonstrated by subjecting production samples to the Qualification Test Sequence shown in Table II.

5.2.1 **PREPARATION OF TEST HARDWARE** - The test samples which are representative of current production shall be prepared in conformance with the applicable drawings, inspection procedures, specifications, and instruction sheets. All hardware shall be identified and coded per drawing. A minimum of five each of the type connector assemblies being qualified shall be submitted for test, and the following required samples shall be represented in the test package.

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The contacts used with flat cable shall be crimped on 3 foot lengths of cable conforming to NAS 729 Type A or equivalent. When qualifying Type II connectors Modu II connectors shall be attached to printed wiring boards made in accordance with Figure 1.

Component parts shall be subjected to inspection and tests to assure product conformance to Section 3 of the specification. Dimensional and visual inspections as well as mechanical and electrical tests shall be performed using both sampling and 100% inspection methods. The inspection system shall meet the requirements of MIL-I-45208. AMP, as the responsible authority shall select the sampling plan, and the acceptance quality level in order to assure the quality of the product. A 1.0% AQL shall be used for major defects and a 4.0% AQL for minor defects. A major defect is defined as a non conforming condition which degrades the performance or reliability of the product to the extent where it does not meet the requirements of Section 3. A minor defect is defined as non conforming condition which will not degrade the performance or reliability of the product to the extent where it will not meet the requirements of Section 3.

- 5.3 TEST DOCUMENTATION - A formal report containing all pertinent test data and analysis summaries, shall be issued at the completion of the qualification test program.


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TABLE II

QUALIFICATION TEST SEQUENCE

TEST SEQUENCE	REQUIREMENT PARAGRAPH	TEST GROUP
Examination of Product	4.3	X
Mating Force	4.4	X
Contact Separation Force	4.7	X
Termination Resistance (Low Level)	4.5	X
Termination Resistance (Rated Current)	4.6	X
Insulation Resistance (Initial)	4.8	X
Dielectric Strength	4.9	X
Maintenance Aging	4.10	X
Thermal Shock	4.11	X
Durability	4.12	X
Temperature Life	4.17	X
Insulation Resistance (After Test)	4.8	X
Vibration	4.13	X
Physical Shock	4.14	X
Moisture Resistance	4.15	X
Salt Spray	4.16	X
Termination Resistance (Low Level)	4.5	X
Termination Resistance (Rated Current)	4.6	X
Dielectric (Sea Level)	4.9	X
Insulation Resistance	4.8	X
Contact Retention	4.18	X
Contact Crimp Strength	4.19	X

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HARRISBURG, PENNA

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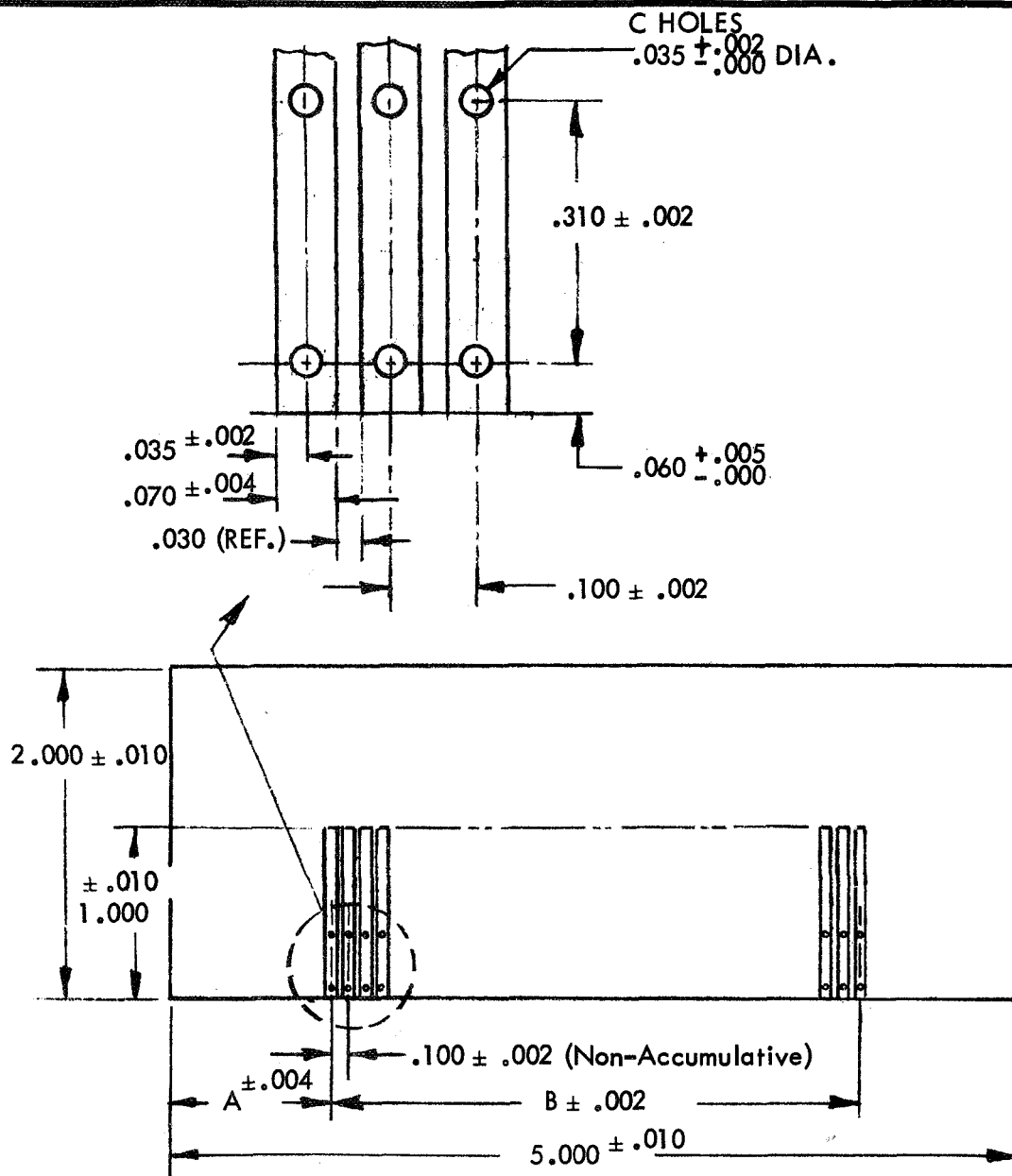
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NAME

PRODUCT SPECIFICATION
FLEXIBLE FLAT CABLE CONNECTOR

NUMBER 108-9,024

AMP SECURITY CLASSIFICATION Customer Release



MATERIAL: G-10 (Glass Epoxy),
Single Clad 1 Oz.
Cu., $.062 \pm .0075$
Thickness

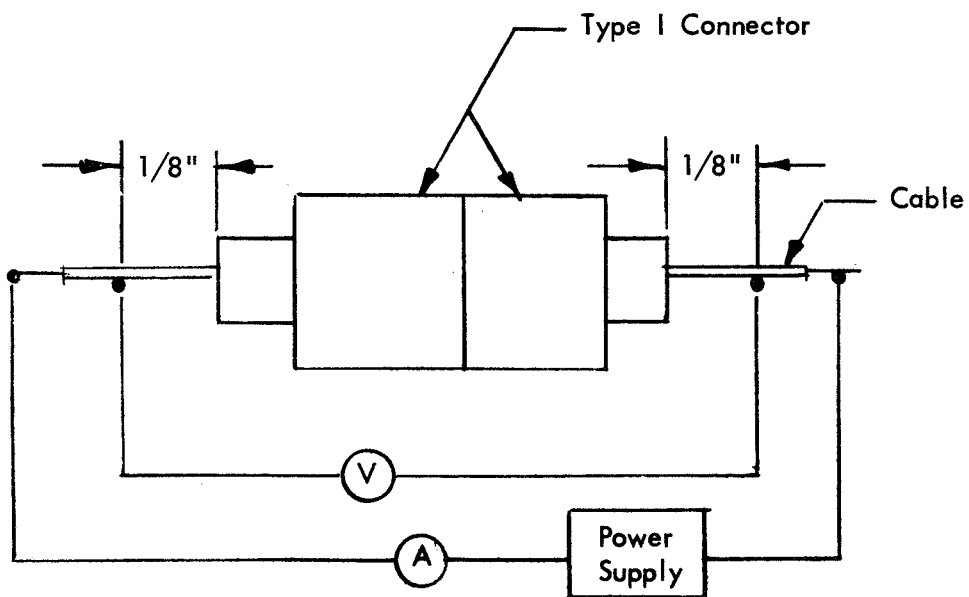
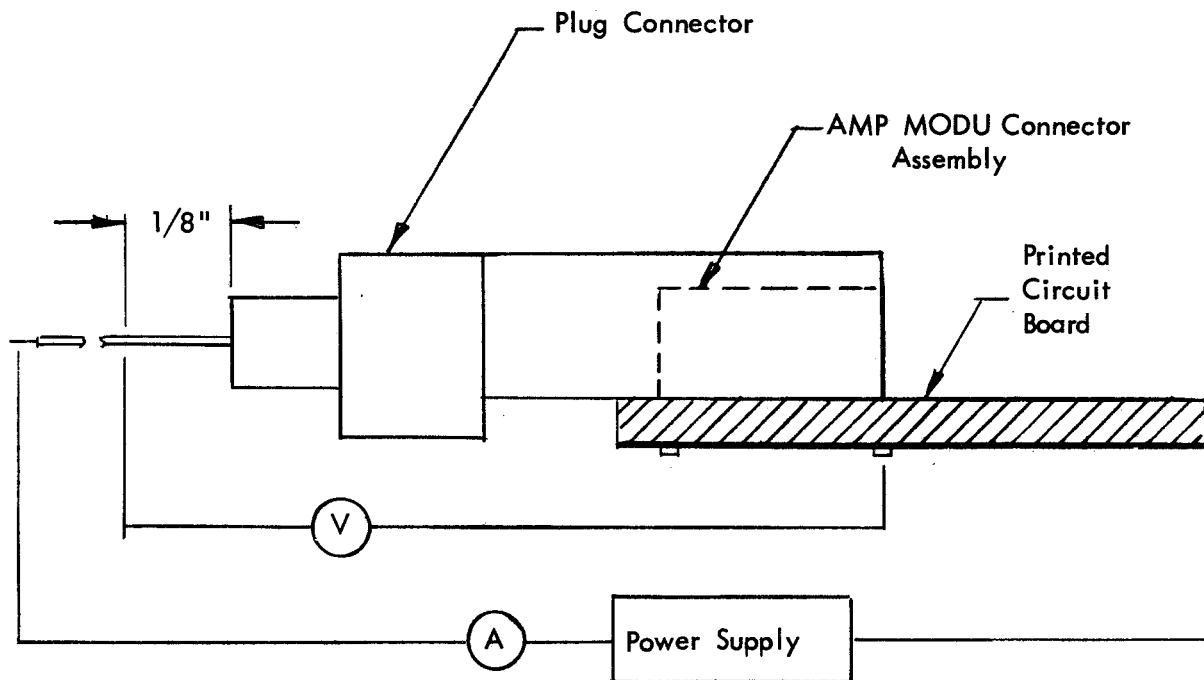
SAMPLE	A	B	C
9 POS.	2.100	.800	18
19 POS.	1.600	1.800	38
29 POS.	1.100	2.800	58
33 POS.	.900	3.200	66

PRINTED WIRING TEST BOARD
FIGURE 1

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FIGURE 2

**TERMINATION RESISTANCE
TYPE II FLEXIBLE FLAT CABLE**



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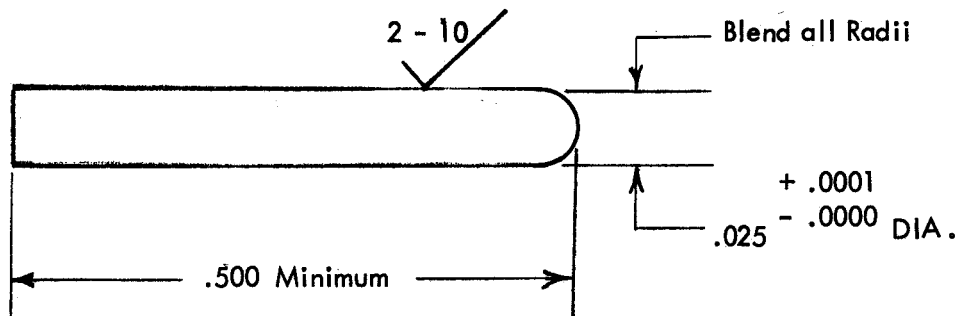
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FIGURE 3
ROUND GAGE PIN



MATERIAL: Van Keuren Alloy Steel

FINISH: 2 to Micro Inch RMS

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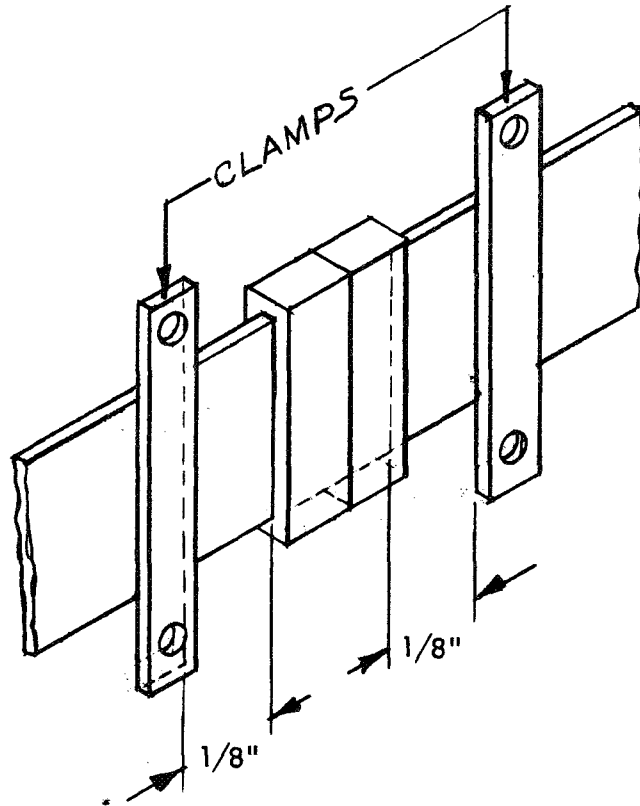
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PRODUCT SPECIFICATION
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FIGURE 4

VIBRATION MOUNTINGS FOR TYPE I

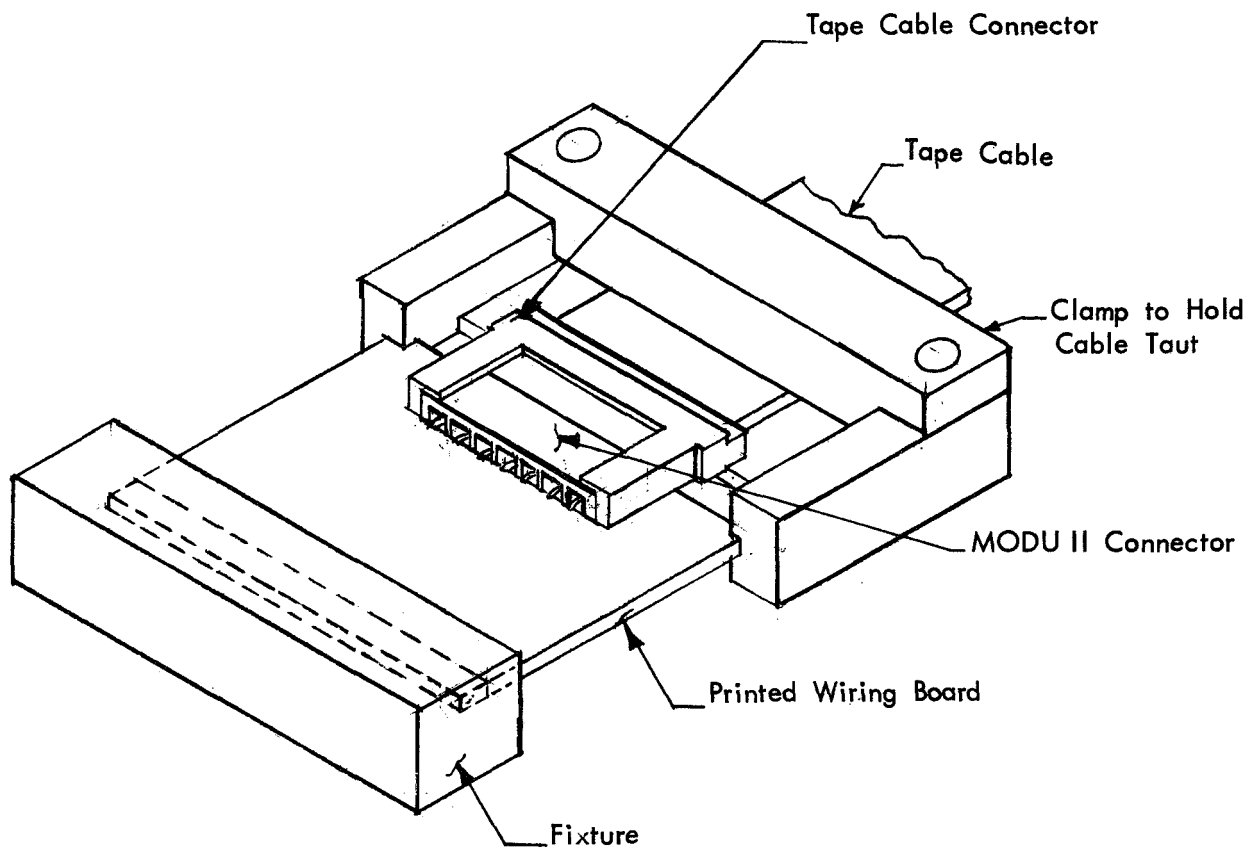


ATTACH ENTIRE ASSEMBLY TO VIBRATION FIXTURE

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FIGURE 5

VIBRATION MOUNTING TYPE II



ATTACH ENTIRE ASSEMBLY TO VIBRATION FIXTURE

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FLEXIBLE FLAT CABLE CONNECTOR					

NUMBER
108-9,024


AMP SECURITY
CLASSIFICATION Customer Release

SUBMITTED BY : Richard E. Wine 5/28/69
Reliability Engineering Date

APPROVED BY : Clifton W. Huffnagle 6/2/69
Development Engineering Date

APPROVED BY : Sal N. Bushey 6-2-69
Product Engineering Date

APPROVED BY : Harold F. DeFries 6-6-69
Test Engineering Date

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ANSLEY

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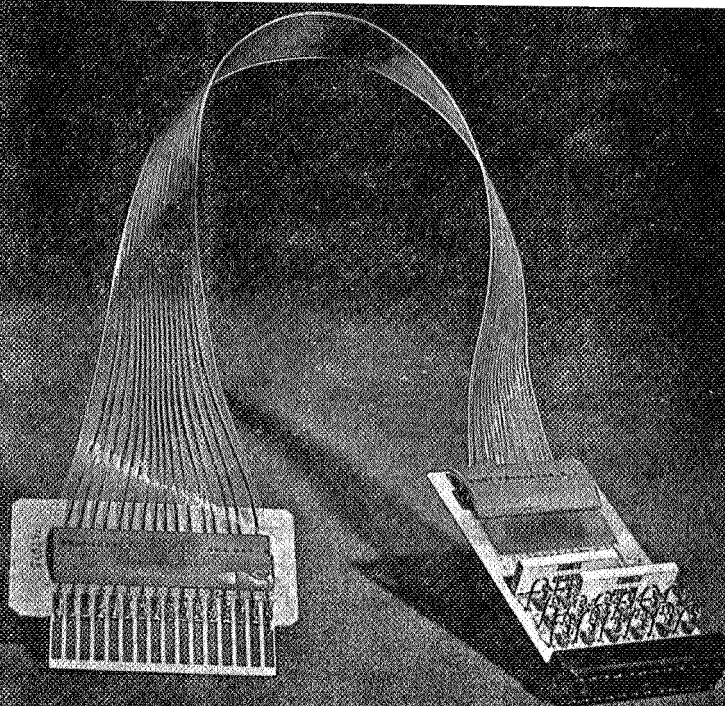
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Ansley

FLAT WIRING ASSEMBLIES



Ansley

Division of Thomas & Betts Corporation



Ansley — A Total Capability

Ansley offers, *from one source*, the advantages of flat wiring assemblies, etched rigid and flexible circuitry, and many unique connecting methods. There need be no compromises or trade-offs. The full benefit of many technologies can be implemented either singly or in combination. The practical utilization of these Ansley capabilities is pictured and described in this brochure.

For Control Wiring

Packaging engineers have long realized that the total cost of interconnection wiring is not directly related to the price of cabling materials alone. When computing total cost all the factors must be considered; (a) labor involved in making connections and installing cable; (b) wiring errors and re-wiring; (c) investment in equipment and tools; (d) repeatable electrical characteristics and (e) long term reliability.

Ansley's application engineers work in close liaison with customer personnel to develop the least expensive, reliable, fool-proof wiring. Developments, such as Ansley "Spread-Pitch",* "Micro-Pitch"**, and mass bonding,** have not only opened new design and application possibilities for flat wiring assemblies, but have been responsible for dramatic cost savings to the user.

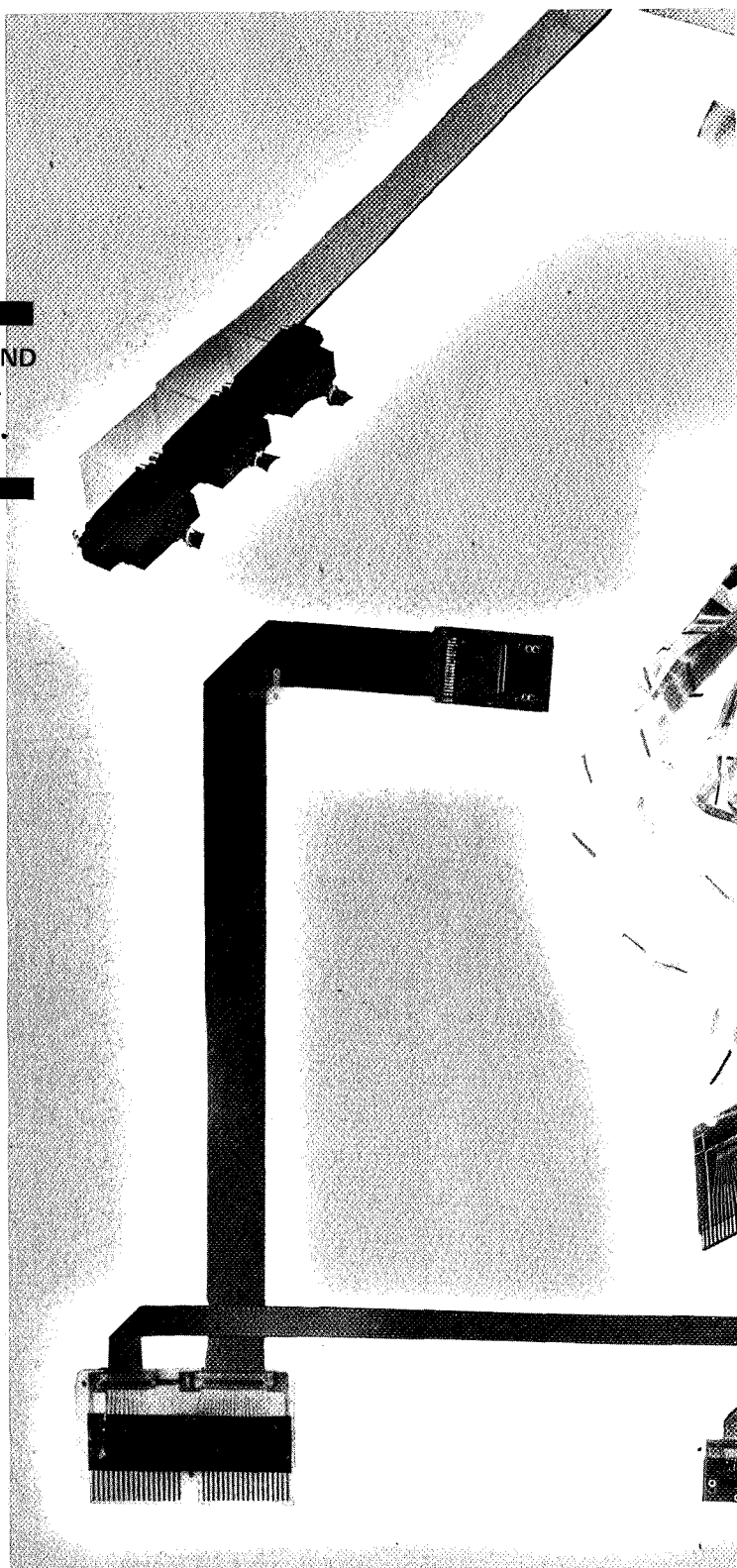
Eliminating Point-to-point Wiring

Conventional, time consuming point-to-point wiring is being eliminated by multi-conductor flat wiring assemblies for today's highly sophisticated circuit systems. Delivered as a package — ready to plug in — they are being used increasingly in computers, business machines, aerospace and defense equipment, communications, instruments and controls, machine tools and home appliances.

The inherent qualities of reliable flat cable assemblies to bend, flex, hinge, or be interconnection wiring that moves, are adding new dimensions to interconnection wiring that save space and weight for high density packaging.

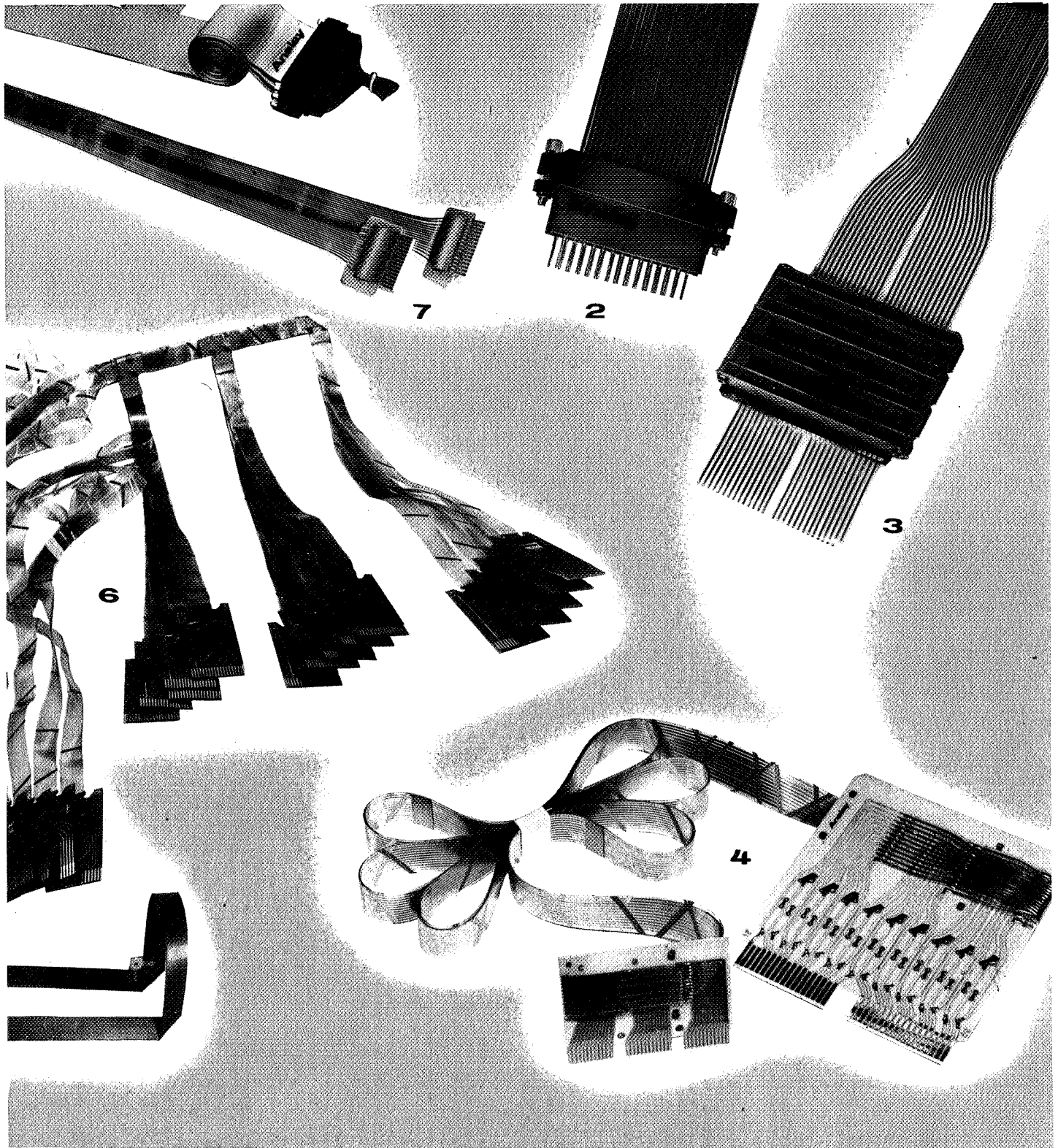
- * "Spread-Pitch" — a significant Ansley development permits universal interface by spreading conductors from the dimensions required electrically to match the optimum hardware dimensional requirements.
- ** "Micro-Pitch" — extremely close tolerance cable of very small conductors (less than 0.0005") with spacing down to 0.001".
- *** Mass Bonding — developed by Ansley to interconnect multiple conductors at one time, drastically reducing cost.

COMPUTER AND COMMERCIAL ELECTRONIC WIRING



1. Triple layers of 36 conductor cable . . . round wires to triple roll-up . . . then, by slitting cable, branch circuitry from each layer back to round wire. 2. 28 conductor cable and rack and panel connector with wire wrap pins. 3. Series of Ansley printed circuit board connectors on 28 conductor cable with "Spread-Pitch" to change conductor spacing from .100" to .156" to match p.c. board. 4. Triple layered 12 conductor cable jumper, strain relieved and connected to p.c. boards mounted with signal balancing devices and components. "Spread-Pitch" from .075" to .125" pitch. Jumpers supplied 11' long. Conductors are of .035" wide

Certain of the Ansley products shown herein are covered by patents and/or pending patent applications.
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copper 2 mils thick. 5. Double side screen shielded cable terminated to p.c. boards. 24" long wide cable used "Spread-Pitch" on one end. Narrow cable 36" long. 6. Multilayered flat cable assembly standardizes all interconnection wiring. 31 conductor transmission cables, strain relieved and connected to p.c. boards, ready to plug-in. Protected with Ansley non metallic isolation material. 7. 16 conductor jumper utilizing "Spread-Pitch" from .075" to .125" pitch. Other jumpers supplied in sizes ranging from 6" to 30" long and with "Spread-Pitch" ends from .050" to .125" pitch. Positive strain relief to protect connection to board.

Ansley

Replacing Coax and Twisted Pairs For Signal Transmission

Ansley Signaflo Multiconductor Transmission Line Systems are designed to specific customer needs of:

impedance	cross-talk
propagation velocity	capacitance.

Our ability to build the controlled characteristics necessary for transmission line interconnection wiring has been the result of pioneering and continuing research in dielectric materials, conductor pitch geometry and shielding technology.

The combinations of signal transmission characteristics are limitless. Frequently systems can be designed without a ground plane... the size and type of conductors and insulation are carefully selected to satisfy all electrical and mechanical requirements. Signaflo systems often incorporate an Ansley developed non-metallic isolation material to control layer-to-layer cross-talk. If shielding is required, solid metal foil, deposited metal, wire mesh or other forms of conductive materials are selectively used on either one or two sides of the cable.

Ansley Signaflo Transmission Line Systems are being designed and used in today's high speed computers (from 5 nanoseconds down to 1 nanosecond pulse rise time). These are highly sophisticated I-O cabling systems which maintain identical electrical design characteristics within and between equipment cabinets.

Three factors of consideration for flexible wire applications are important.

1. ELECTRICAL AND MECHANICAL

Excellent dielectric properties are available in extremely thin, very flexible films with high strength, resistance to abrasion, tension, tearing and cracking. When fully annealed copper conductors or Ansley super flexible conductors are bonded between such films, flat cable with excellent electrical characteristics and an almost indestructible flexibility results.

2. TYPE OF FLEXURE

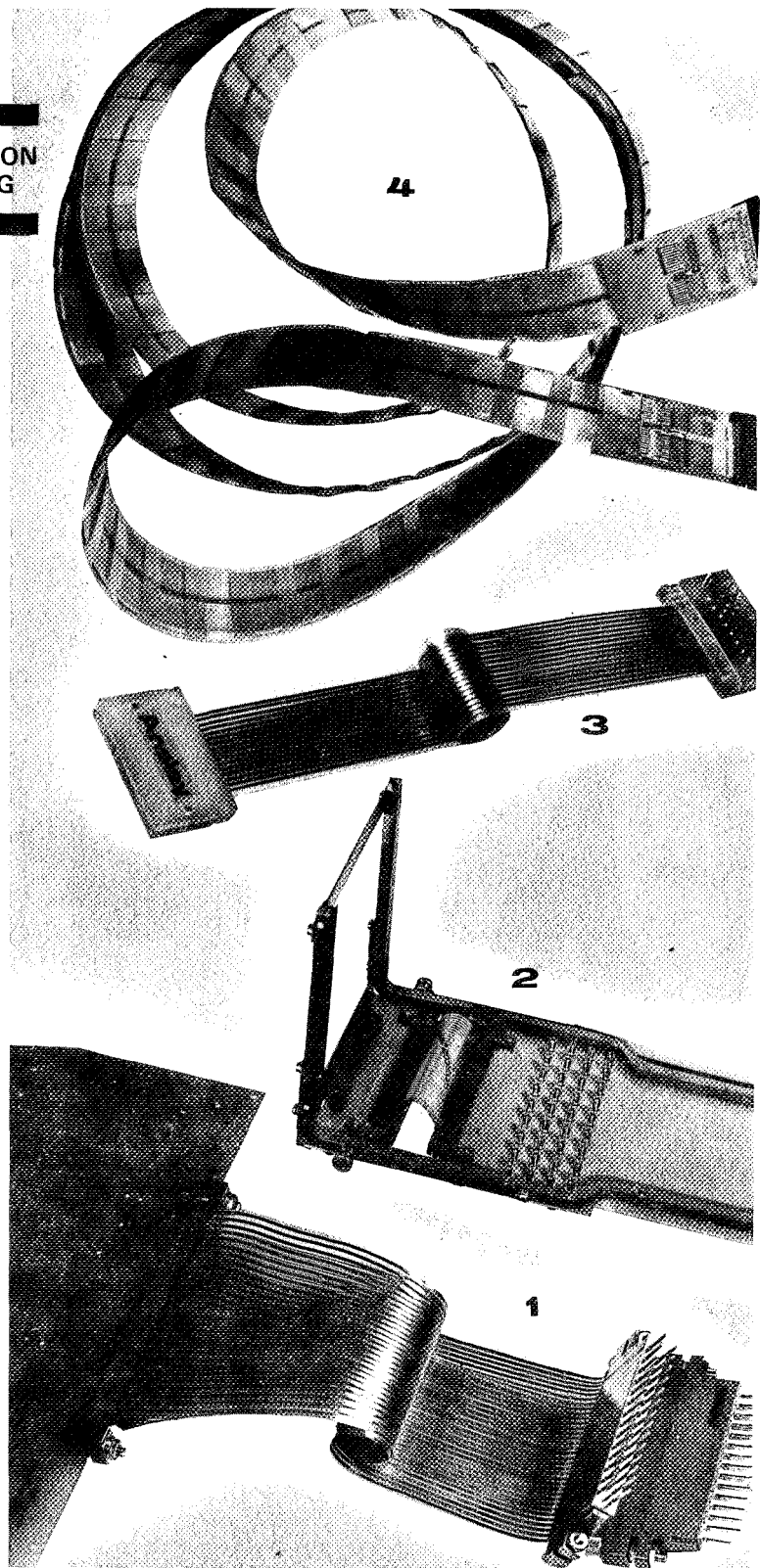
Requirements for flexing vary greatly to meet each application. One application required a limp assembly which produced no measurable resistance to motion on circuitry connections to air bearing supported disc/drum memory heads. Another difficult requirement was that in which multi-million flexures were made at significant "g" loadings. Ansley flexible assemblies lend themselves to a multitude of flexure requirements not possible by other means.

3. PACKAGING

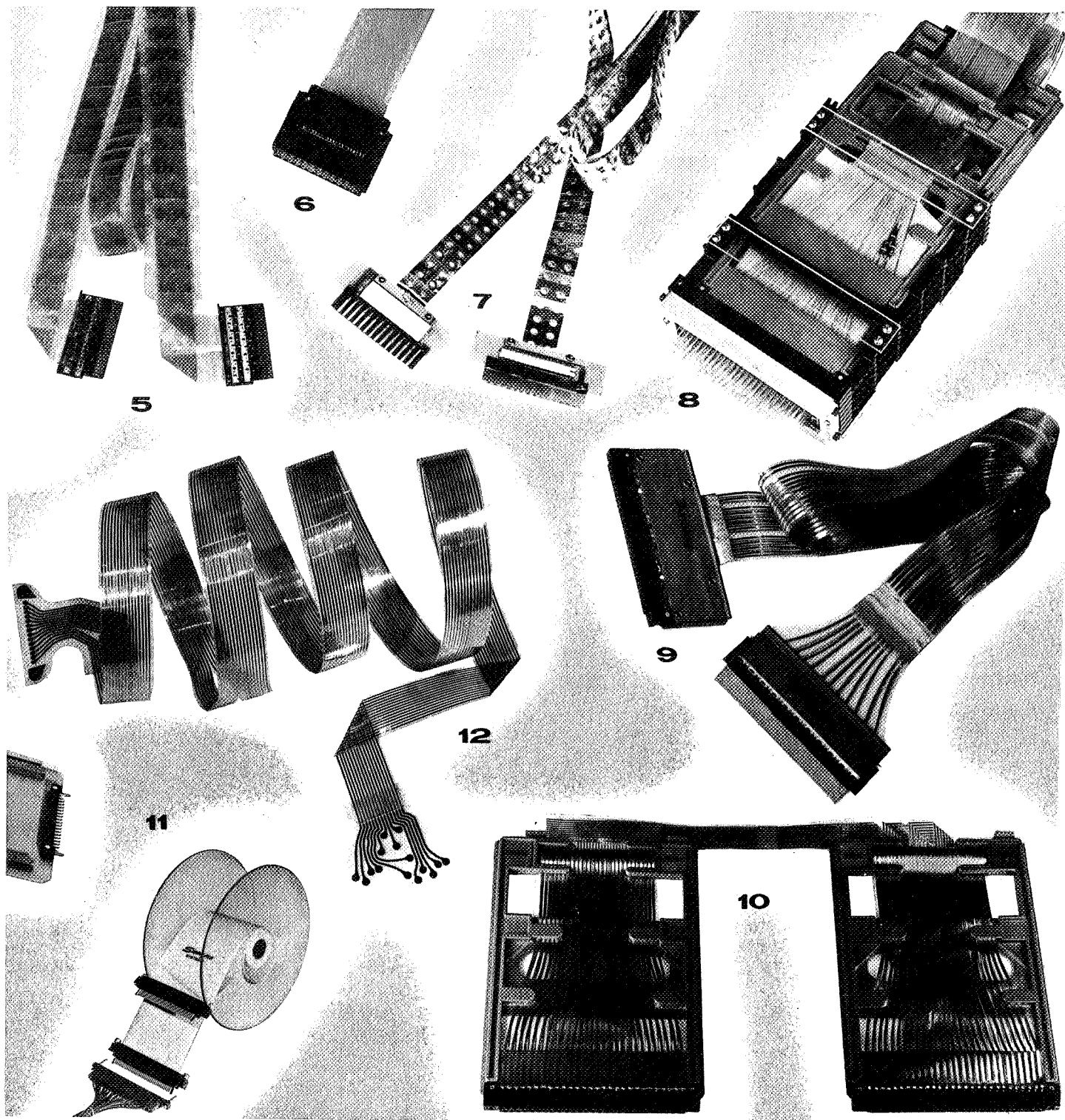
Wherever wiring must move, hinged panels or doors, traveling heads on machinery, rotating equipment, or rack and panel wiring. Ansley flat wiring assemblies offer major advantages. Mechanical helpers such as springs, pulleys, jointed arms or other hardware can be eliminated. The configuration is dependent on packaging requirements of space, weight, travel, etc. Heat formed radii, roll-ups, lazy "S" and accordion are a few of the techniques used.

TRANSMISSION LINE WIRING

FLEXING WIRES



1. Ansley assembly to connect mother board to distribution area which allows board to be retractable without electrical interruption uses double layered roll-up utilizing "Spread-Pitch" cable, .100" to .156" pitch. Note conductor spacing to interface with p.c. board. Special clamps hold cable to p.c. board on one end... other end uses connectors fitted with wire wrap pins. 2. Assembly for p.c. card check out with 36 conductor, 2" long cable which acts as hinge for 90° movement of card holder between p.c. board connectors. 3. Miniature roll-up for 15" extension of removable chassis with special connectors to match customer hardware. 4. Signaflo transmission line system for 115 ohm controlled impedance level. Cable has signal transmission lines on either side of larger conductors which are current carrying and eliminated the need of two separate cables. 5. Signaflo transmission line system for 100 ohm, 1.45 nanosecond velocity of propagation requirement. Multi layered cable separated by a ladder type Ansley non-metallic isolation barrier which keeps the cable in place as well as



isolates the cable layers from each other or the chassis so that electrical characteristics do not change. 6. 100 ohm Signaflo transmission line system with 18 conductors. Capacitive coupling is 4% maximum between 2 adjacent signal lines with minimum cross-talk. 7. Signaflo transmission line system for 84 ohm, 1.5 nanosecond velocity of propagation requirement. ac metallic isolation barrier protects shielded cable from outside interference. 8-9-10. Various Signaflo system jumpers for card racks to replace expensive assembly. Molded card holder functions as cable holder, strain relief, two layer separation barrier and connector mount. "Spread-Pitch" cable is .075" to .150" and .100" to .400" pitch. 11. Special spool to guide extremely long extension of roll-up for machinery control application. 12. Signaflo Transmission line system to connect read-write matrix on computer. System required 93 ohm controlled level of impedance and cross-talk 25 db or better. "Spread-Pitch" in center of 4' long jumper allowed mounting support through cable. Ends of cable connected to Ansley Free-Flex flexible etched circuit.

Ansley

Division of Thomas & Betts Corporation



I/S STRUCTURAL SYSTEMS FOR MEMORY DEVICES

Today, with Interconnection and Structural Systems for Memory Devices, Ansley is the only company that produces systems to cover every requirement for new memory technologies. Ansley developments and techniques have been especially sensitive and responsive to these requirements.

Plated Wire Support Structure, Word Line and Keeper

- * As part of the I/S System for Memory Devices plated wire support structures of short or very long lengths with precision spacing and quality insulation are available in various types such as flat and contoured. The customer's plated wire is either inserted and connected or the tunnel structure left open to receive the plated wire. Single, doubles or other multiples of word lines are bonded to the tunnel structure in full turn, half turn or multiple turn configurations.
- * Planar thin film memories require close tolerance spacing for matrices to which Ansley's "Micro-Pitch" capability responds so precisely.

To tailor memory packages to specific customer requirements, Ansley memory packaging techniques also encompass close tolerance positioning of sense-digit and word-line structures and matrices for planar thin film memories.

Flux Concentrator (Keeper)

- * The inclusion of Ansley's flux concentrator or flexible "keeper" to the I/S System as an integral element offers distinct advantages to both plated wire memory plane and planar thin film memories. Adjacent bit interference is minimized with improved electrical and magnetic properties.

High Density Sense-Digit Lines

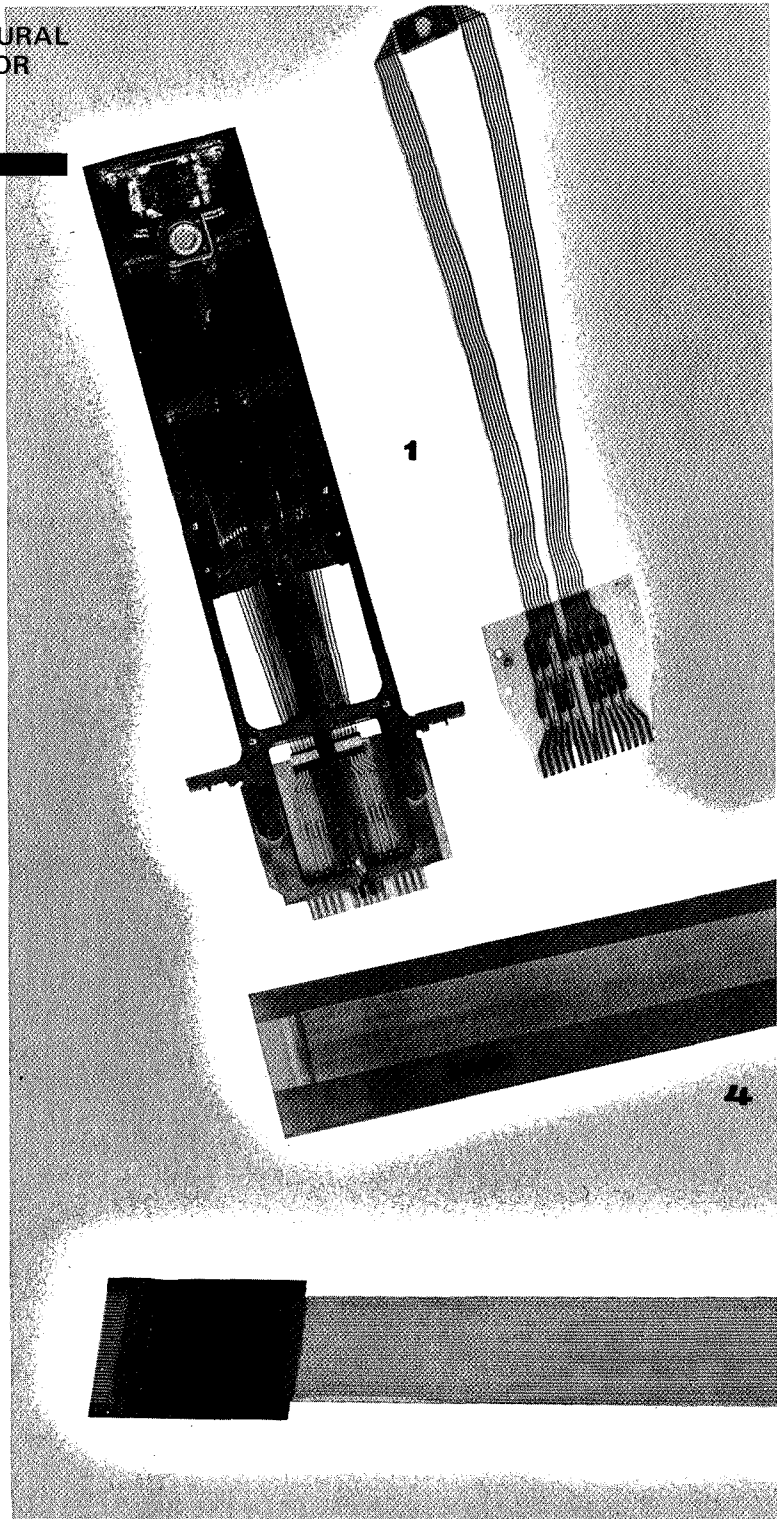
Wires smaller than 1/2 mil diameter with extreme precision sense-digit line spacing tolerances present new concepts for high speed and high density memories. Work is progressing on densities of 1000 wires per inch. Super conducting materials and Niobium for cryogenic memories are under investigation for use in I/S Systems for Memory Devices.

Disc and Drum Memory Interconnection

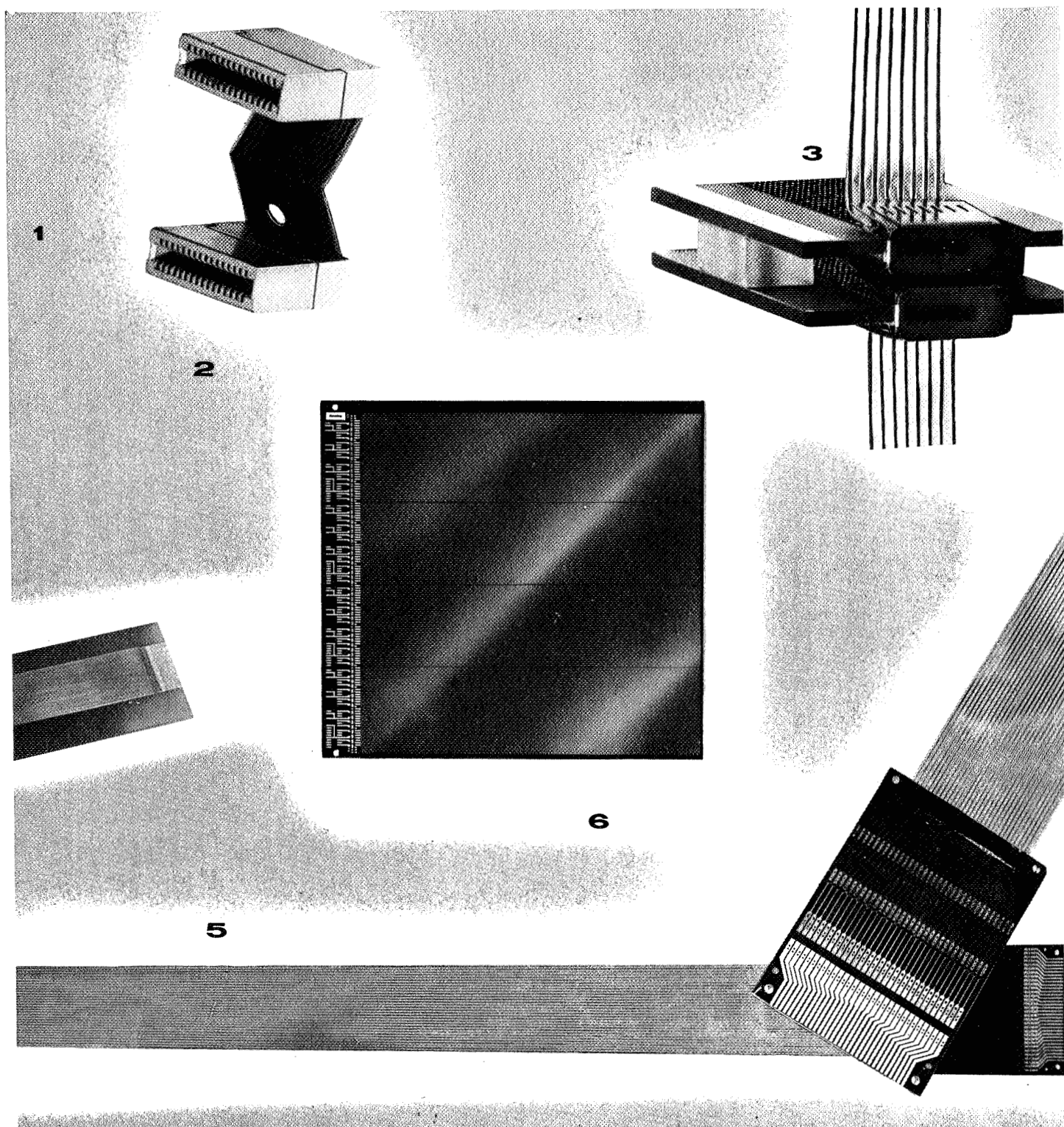
The requirements for disc and drum memory interconnection wiring for high speed, high "g" loading travel is being met by super flexible Ansley I/S Systems. Laminates of thin (less than 1/2 mil) copper and thin exotic dielectric materials offer lightness, strength and flexibility for multi-million in-service flexures.

Core Stack Interconnection

Dependant upon each manufacturer's particular design requirements to interconnect adjacent memory plans, Ansley has developed non-removable and removable interconnection systems for plane to plane or Ansley has developed systems stack to stack interconnection. These I/S Systems offer high reliability, lower cost and in most instances distinct servicing or rework advantages.



1. Super flexible dielectric films and thin (1 mil or less) copper conductors can be laminated by Ansley to make the cable for Signaflo I/S Systems (super flexible dielectric films cannot be etched). Photo at right is super flexible Ansley I/S System used for Disc Memory interconnection. Oxygen-free rolled copper laminated between thin, super-flexible dielectric material produced interconnection wiring with no measurable resistance to mechanical pressure to magnetic pick-ups from drums floating on air bearings. Photo at left shows assembly installed in carriage. 2. Interconnection jumper for high density core memory stack. Two standard p.c. board diallyl phthalate connectors (.050" pitch). Two layers of polyimide flat cable terminated by Ansley mass bonding, with strain relief provided by glass reinforced nylon cover molded to connector. Pre-folded accordion layers of cable allow stacking density of 5/16" center-to-center of connector for top-to-bottom and bottom-to-top memory interconnection. This type interconnection jumper



assembly is also furnished in other configurations and for screw mounting. 3. Core stack interconnection is but one type which gives extremely high packaging density as well as removability for replacement of a plane. The system shown is for conductors on .050 pitch. 8, 16, 32 and 64 conductor interconnection can be supplied. Conductors are interrupted in connector for $2\frac{1}{2}$ D memories. 4. Ansley I/S System which is a 10" long plated wire support structure with plated wires connected to etched substrate. 5. Over 6' of sense digit cable for planar thin film memory. Close up shows Ansley "Micro-Pitch" cabling of sense digit multiples and their connection to the p.c. board. 6. Ansley I/S System which includes plated wire support structure, word strap and flux concentrator. This I/S System required proper selection of materials, close tolerance positioning and "Micro-Pitch" precision spacing of conductors.

Ansley
Division of Thomas & Betts Corporation

The rigid requirements of the avionics industry for military acceptance demand the use of flat cable assemblies produced by the Ansley Flex-Weld process.

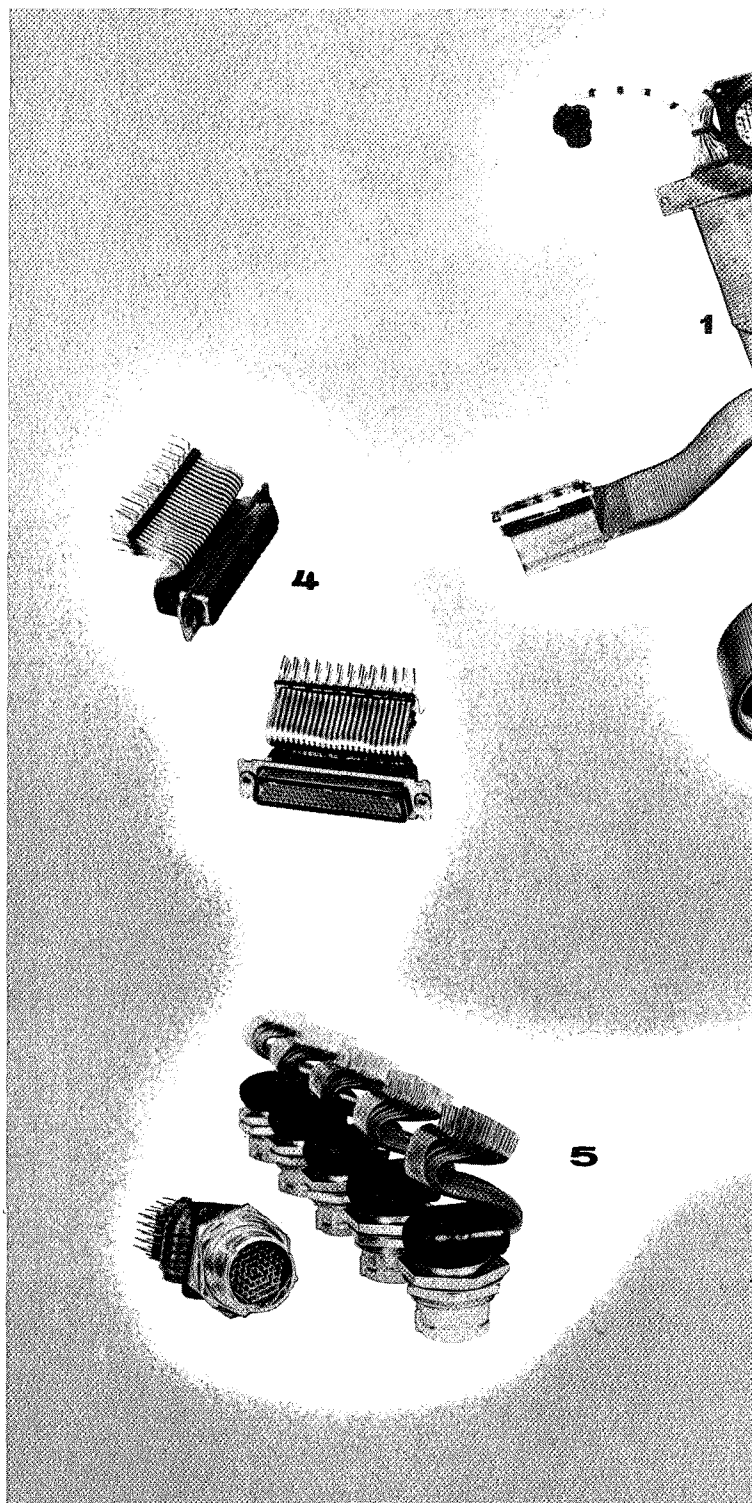
The Flex-Weld process provides strength equal to the original cable material itself, to terminations welded through the insulation without stripping. All-welded hard terminations of pins, eyelets or weld tabs can be made to flat cable and etched circuitry, whether rigid or flexible. Thus every type connector, either rectangular with in-line pin arrangements or round connectors, can be accommodated.

Resistance to severe environments, extreme vibration and shock are demanded. Long-life flexibility, reduced size and weight, elimination of wiring errors, repeatable electrical characteristics and long term reliability are demanded. All these demands are being met with Ansley Flex-Weld cable assemblies.

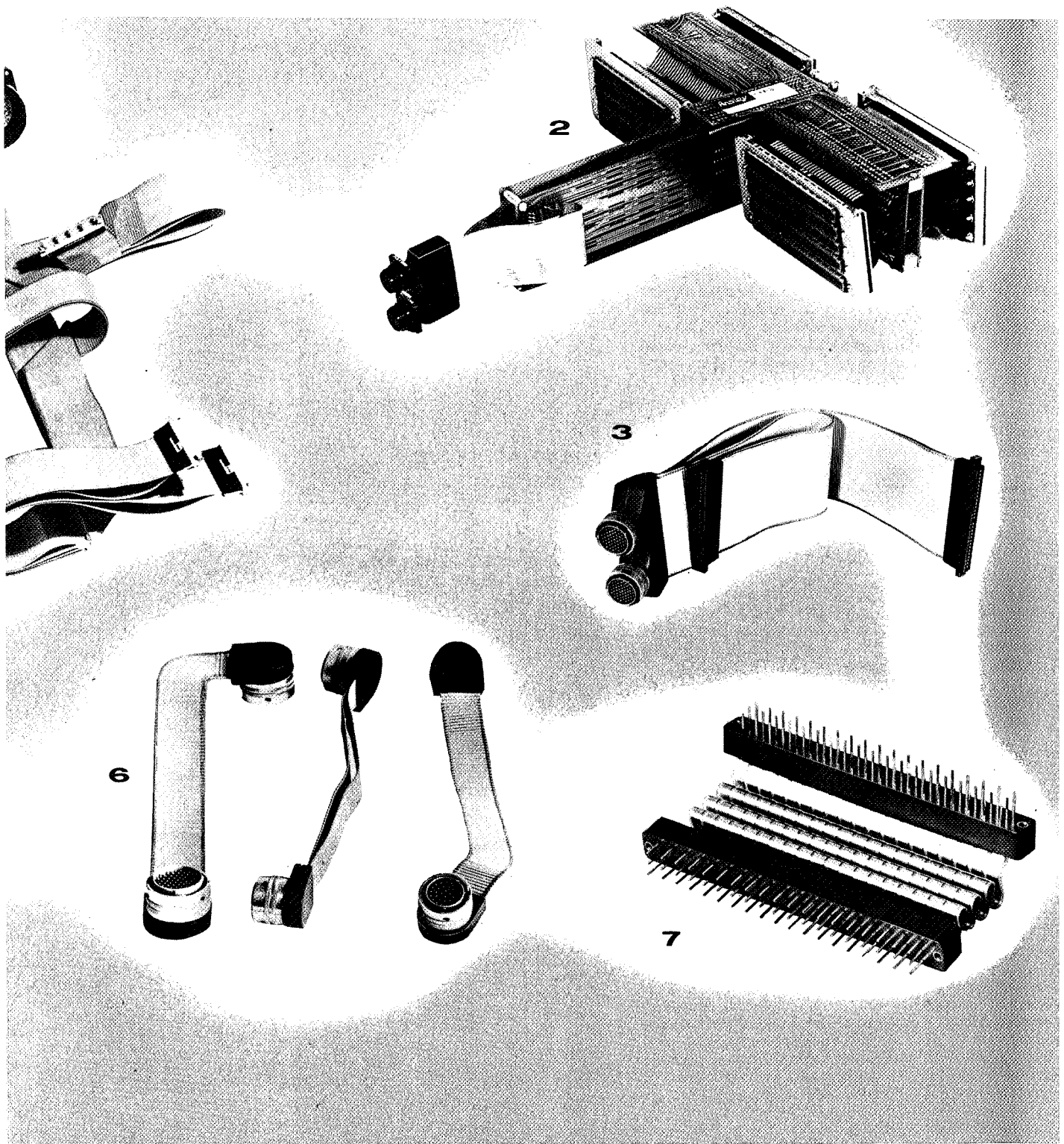
One typical example is a Flex-Weld cable assembly in the Lockheed Agena Space Vehicle. Application of Flex-Weld techniques permitted a 2 to 1 reduction in volume in a circuit distribution center. To accommodate necessary circuit programming changes in instrumentation channels, a wire wrap distribution panel is used to make connections at random among 19 external connectors having a total of 971 contacts. The entire assembly is contained in a box measuring 7 x 8 x 4 inches. Flat conductor cable in multilayer array with electrostatic shielding between layers makes the small size possible. All welded Ansley Flex-Weld terminations provide reliable system operation at 7 G's for 25 minutes on each axis.

Other examples which display equally outstanding solutions to interconnecting wiring are shown on these pages.

Most of the applications on this page show Ansley Flat Cable Systems terminated to AN or other Mil approved connectors for military or aerospace applications. The wide diversity of terminating techniques offered by Ansley make flat cable systems universally applicable.



1. Shielded Flex-Weld® drawer cable with multiple branching permits high density for advanced fire control system. Transition to Bu Weps input/output connectors is made with stranded wire. Internal connectors mate with wire wrap blades. 2. Flex-Weld cable assembly provides integrated interconnect system which accommodates over 2000 random interconnections in advanced avionics equipment. Five multilayer interconnect boards, two 2-sided component boards, 20 cable assemblies with card edge connectors and solder pin terminations. 3. Flex-Weld shielded cable assembly with solder pin terminations at both ends, and one input/output cable assembly form separable modular components. 4. Flex-Weld shielded cable assembly for submarine navigation system console drawer interconnection. Cable withstands over a million flexings over a 1" radius. All cables are shielded both sides.



with the shielding periodically welded to ground conductors in the cable. 4. Four layer Flex-Weld flat cable system formed in a service loop for input/output connections from 100 pin miniature D type connector to a mother board. Solder terminal pins coincide with hole pattern in mother board. 5. Multilayer 61 conductor high density Flex-Weld jumper to withstand severe vibration and shock. Carries power supply to mother board in missile application. 6. Flex-Weld shielded two sides, flat cable assemblies for advanced space vehicle application. Corrugations provide flexibility and long flex life. 7. Flexible heavy-duty Flex-Weld jumper for power handling application on advanced missile required copper conductors with .005 x .200 cross section to carry high currents. Three layers of Mylar insulated flat cable are terminated with wire wrap pins.

Ansley

Division of Thomas & Betts Corporation

Free-Flex Etched Circuitry

CHEMICALLY CREATED CIRCUITRY

Free-Flex® Circuitry gives electrical and electronic packaging engineers a versatile design tool to accomplish multiple objectives.

Free-Flex Circuitry includes a wide adaptive range of insulator films: polyesters, fluorocarbons, impregnated glass cloth, epoxy, polyimides and others. The choice of material is dependent upon electrical, physical and environmental requirements.

Conductors are usually electro-deposited or rolled copper foil available in various thicknesses to meet current carrying requirements as well as flexibility. Fine line etching down to .003" line widths and .003" spacing is available and produced with specially processed rolled copper foil, which allows 180° creases in any direction without fear of distortion or cracking.

Many types of conductor terminations are available: solder pads, eyelets, pins, connectors, plated-thru-holes, Ansley Flex-Weld technique, which permits welding through the insulation, or Ansley's mass bonding method.

Free-Flex Mark II Circuitry

Free-Flex Mark II Circuitry is a significant Ansley development for flexible circuit fabrication which fusion bonds FEP Teflon, Kapton and OFHC copper. By eliminating the problems of combining these well proven materials, Ansley Free-Flex Mark II Circuitry is ideally suited to high performance applications, such as:

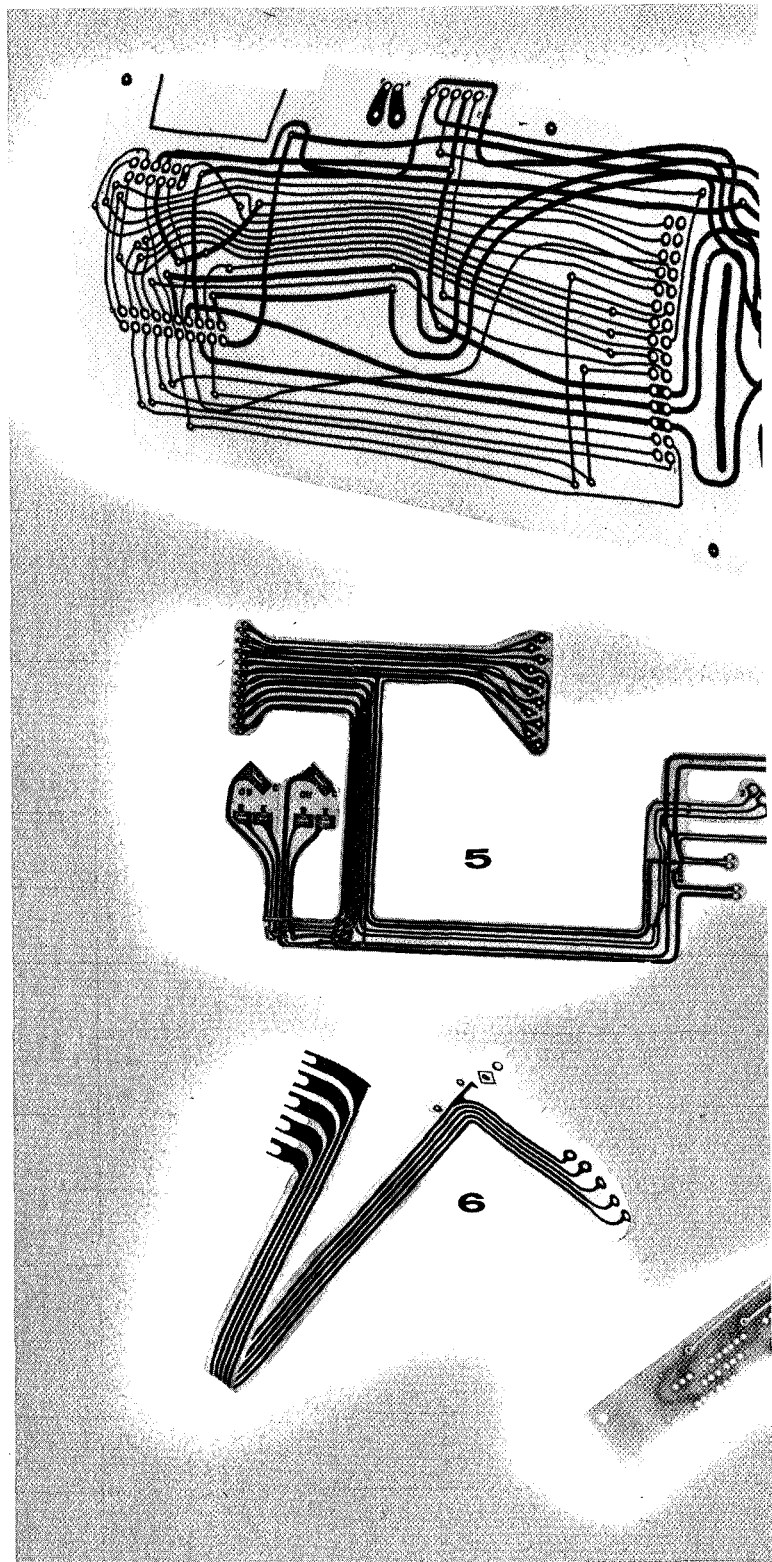
- (a) Single layer flexible circuits.
- (b) Two layer flexible circuits with multiple cross-overs.
- (c) Flexible circuits with crossovers which provide twisted pair electrical characteristics.
- (d) Three-layer circuits with controlled impedance transmission line characteristics.
- (e) Free-Flex cable/connector assemblies.

Kapton gives abrasion resistance, dimensional stability and high strength to Free-Flex Mark II Circuitry. Teflon, which does not absorb moisture and is extremely tear resistant, effectively cancels the deficiencies of Kapton in these properties. Both Kapton and Teflon are excellent for high temperature environments.

Outstanding electrical performance results from the high dielectric strength of Kapton and the low dielectric constant of FEP Teflon. Each conductor is fused to and surrounded by Teflon FEP which provides the best possible electrical isolation. Kapton, bonded to the surface of the FEP Teflon, provides the high dielectric strength to electrically insulate each layer.

The fusion also creates an exceptionally high peel strength and prevents wicking during any subsequent plating or soldering operations.

This Ansley developed fusion bonding process eliminates the need for plated-thru-holes or eyelets, since the open solder pads can be repeatedly soldered without fear of delamination or pad lifting. Complex circuitry can utilize solder pads on both the front and the back side of the flexible pattern.



1. Free-Flex Circuitry for wrap-around application with connecting pads precisely positioned. Various weight copper conductors used to carry current requirements.
2. Fusion bonded Free-Flex Mark II Circuitry hold exposed pads firmly in place for multiple soldering cycles.
3. Flat cable to round wire assembly with fusion bonded Free-Flex Mark II Circuitry providing interconnection strain-relief of unusual strength.
4. Super-flexible fine line etching Free-Flex Circuitry for moving wire application.
5. Above average current required 5 oz. copper conductors and glass reinforced film. Multilayer with interlayer connections accomplished by plated-thru-holes. Interfacial holes are then completely insulated by outer



layers of film. 6. Unusual single layer Free-Flex Circuitry with exposed pads for interconnection. 7. Free-Flex Circuitry provides an ideal interconnection for hard boards. Ansley mass bonding method used for interconnection which was then stress relieved and insulated with potting compound. 8. Ansley multilayer bus bar with chemically milled conductor elements to provide bussing on mother board. 9. Free-Flex Circuitry using hard board material (glass epoxy) for substrate. Rigid hole-to-hole tolerances held on over 1000 plated-thru-holes only .0135" dia.

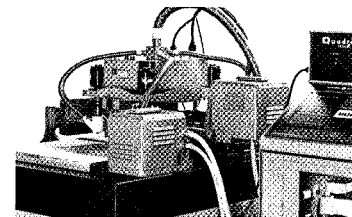
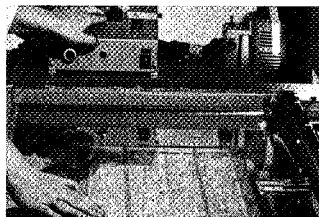
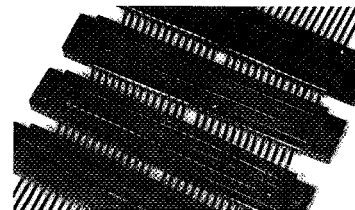
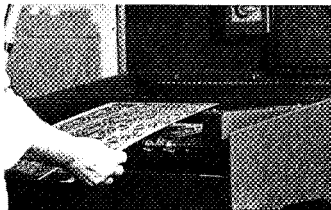
Ansley

Ansley Flat Wiring Systems – Design Criteria

General:

Due to the special nature of each application, Ansley Flat Wiring Assemblies are custom designed. Many systems are designed using combinations of flat cable and chemically created circuitry. Because each method has its own specific design criteria we are presenting the following data in two sections. One covers flat wiring assemblies structured from cable with individual conductors (flat, round or shaped) laminated between various dielectric materials. The other covers flexible etched circuitry which is obtained by chemically producing circuitry on a substrate which is then covered by various dielectric materials.

Ansley's capability in producing all types of inter-connection wiring indicates our capacity to respond with practical solutions to the entire electronics industry.



FLAT WIRING SYSTEMS (not etched)

Electrical Characteristics

Current carrying capacity is dependant on conductor dimensions, temperature rise above ambient allowable, conductor and cable geometry and dielectric material used.

The equivalent of AWG sizes from 10 to 60 in various cross-sectional shapes and spacing give wide latitude in current capacity, surge impedance, speed of propagation, attenuation and cross-talk characteristics.

A line to ground DC or peak working voltage of 3000 volts is easily attained with the dielectric materials commonly used.

Ansley Application Engineers have wide experience in the design of systems to meet specific electrical requirements.

Dielectric Materials

Materials used as dielectrics include fluorocarbons, polyamids, polyesters, polyimides, polyolefins, silicone, vinyls and various combinations thereof in order to suit the materials electrically, physically and thermally to the job requirements. Quite often a higher priced raw material will yield a lower cost or better quality system for the same cost than apparent "economy" insulating systems. This is a major part of the Ansley design engineer's responsibility . . . designing the best possible system at the lowest cost to satisfy your requirements for a reliable high quality system.

Lamination

Ansley's rigid specification for cable demands a sealed lamination (when required with a high-strength bond of the conductors to the laminate). In service stability and resistance to environmental conditions are thereby assured. Ansley has developed a wide selection of cable bonding methods and materials . . . some rather exotic, such as one-side-only dielectric.

Conductor Pitch

Standard grid spacings (.025", .050", .062", .075", .100", .156") as well as specials are available. However, Ansley's development of "Spread-Pitch" allows narrow pitch cable to be used and yet match hardware contacts with various dimensions for interconnection simplicity.

Ansley's "Micro-Pitch" allows very small conductors (less than 0.0005") to be closely spaced (0.001") and to be held to extremely close tolerances.

Cable Width and Length

The practical requirements of packaging are usually the limiting factor as to width of cable. Many applications requiring a large number of conductors are best handled by multi layer systems, or reduction of the pitch to produce higher density of conductors. However, cables in excess of 10" wide have been supplied.

Shielded or Unshielded Cable

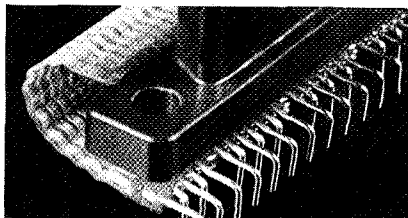
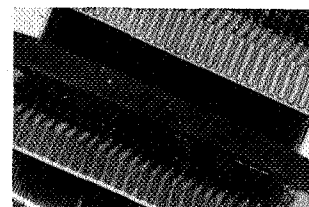
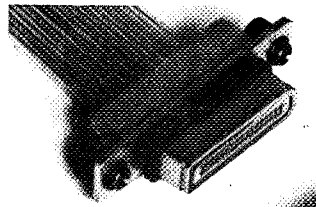
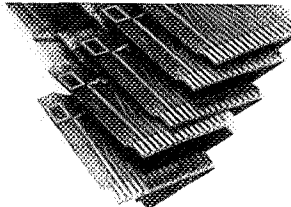
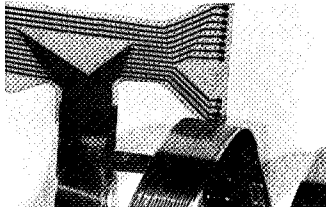
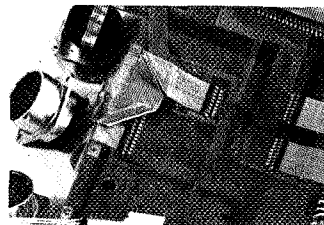
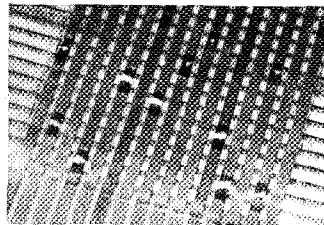
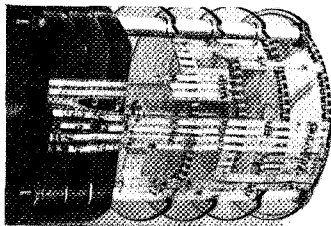
For signal transmission lines the physical as well as the electrical requirement of the application dictate the nature of shielded or unshielded cable. Such controlled characteristics as impedance value, propagation velocity, capacitance and cross-talk level, etc., are possible with Ansley Signaflo Systems. Cabling parameters remain the same from assembly to assembly due to the fixed orientation of conductors; thus capacitance and impedance properties of the system are predictable and may be designed for the specific application. Various forms of conductive material such as metal foil, deposited metal, wire mesh, etc., are utilized on either one or two sides for shielding. Ansley's non-metallic isolation barriers control cross-talk in multi-layered cable systems.

Ansley Flat Wiring Systems Termination Methods

Ansley has developed techniques and processes for reliably terminating flat cable to meet the demands of various environmental, electrical and mechanical requirements for applications over a broad spectrum of both military and commercial applications.

Cable Conductor Used as Contact

This basic method requires stripping the insulation, selective plating of bare conductors and locking in a shell or connector body to become a male blade or female receptacle (See page 10).



Welded Terminations

Ansley patented Flex-Weld process used to either directly weld the cable conductors to weld tabs or to pins for solder or crimp pots. Welding is through insulation and does not require stripping the insulation. As can be seen in the photographs to the right, the Flex-Weld process permits cable to be terminated into almost any type connector. Round connectors are easily accommodated by folding and forming cable ends to match any contact layout. All connectors are normally potted for stress relief. For flexible etched circuitry the Flex-Weld process provides all-welded hard terminations of pins, eyelets or weld tabs.

Ansley Mass Bonding

A proprietary process developed to terminate all the conductors of multi-conductor cable at one time. This has drastically reduced the cost of reliably terminating flat cable to rigid or flexible circuitry. Many of the illustrations throughout this booklet are examples of Ansley mass bonding flat cables to rigid circuitry or the interconnecting of closely spaced conductors required by I/S Systems for Memory Devices. Mass bonding requires that the cable insulation be stripped — again by proprietary techniques developed by Ansley.

The termination of flat cable to rigid circuitry makes it possible to utilize the advantages of multilayer boards with plated-through holes for component mounting, etc.

CHEMICALLY CREATED CIRCUITRY

The following material is presented to give an indication of the broad possibilities of Ansley Chemically Created Circuitry, which includes Ansley Free-Flex Flexible Etched Circuitry and Ansley Rigid Circuitry. Used singly or in combination or combined with flat cable, cost saving, high reliability circuitry performing multiple objectives can be accomplished. Both photo-etching and chemical milling are basic processes employed to produce Ansley Chemically Created Circuitry.

Materials

Conductors — different metals are available for varying requirements. The usual conductor material specified is electro-deposited or rolled copper foil. This copper foil can be provided in various thicknesses up to 5 oz. Other thicknesses are possible for specialty circuits.

Dielectric substrates — Ansley Free-Flex and Free Flex Mark II circuitry includes a wide adaptive range of insulator films: polyesters, fluorocarbons, impregnated glass cloth, epoxy, polyimides and other base materials. Choice of material is dependent upon the physical and electrical, characteristic and environmental conditions required for specific applications. These materials may also be used in conjunction with the broad range of materials available for rigid circuitry when combinations of Free-Flex circuitry and rigid circuitry are required.

Lamination

Specifications usually require a sealed lamination with a high strength bond consistent with stability and resistance to environmental conditions.

Line Etching

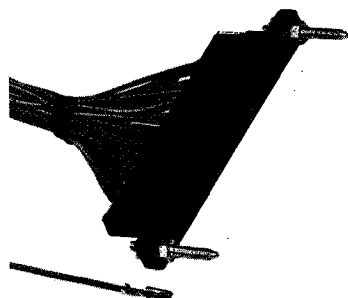
Fine line etching down to .003" line widths and .003" spacing is available. Free-Flex circuitry requiring 180° creases in any direction without fear of distortion or cracking produced from film with specially processed rolled copper foil of exceptionally fine grain structure.

Termination

In general, solder pads, eyelets, connectors, plated-thru-holes and welded thru the insulation pins, using the Ansley patented Flex-Weld process, are used.

Interconnection of flat cable or hard boards to flexible circuitry is made economically by the Ansley mass bonding process which simultaneously interconnects even extremely fine line etchings. This has greatly reduced the cost of interconnections, especially in miniaturized circuitry. The circuitry package can be greatly simplified using plated-thru-holes for layer-to-layer interconnection in multilayer circuitry.

Ansley



Basic Elements and Techniques of Ansley Flat Wiring Systems

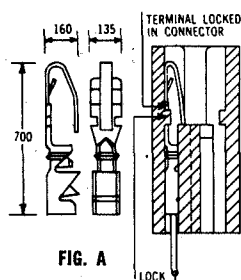


FIG. A
**Transitional Connector
for Round Wire**

Often equipment uses round wire and to make the transition to Flat Conductor Cable, Ansley has designed a receptacle block to hold leads having especially designed crimped Ansley terminals which are firmly locked into precision cavities (See Fig. A. above). Wire-wrap pin contacts are also available. The block is molded of dimensionally stable polycarbonate resin. Circuit numbers are molded on the connector shell for identification. Terminals are gold plated beryllium copper, providing positive, spring contact and long insertion life. Built-in polarity key and security lock* assure proper alignment and positive holding.

*Quarter-turn fasteners also available.

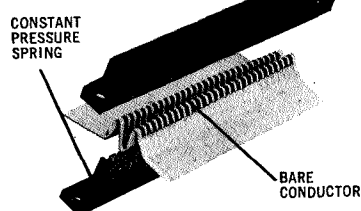
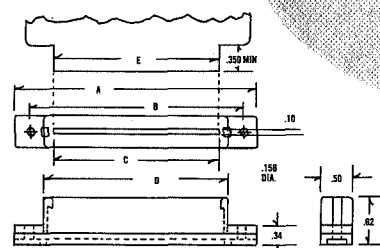


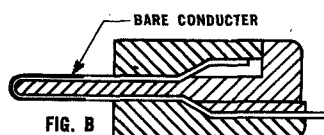
FIG. C



Mid Span Tap (Flat To Flat)

The selectively gold plated contact area of the Flat Conductor Cable is formed and locked into the connector housing. To assure positive electrical contact of each conductor, a stainless steel spring exerts pressure on each conductor.

The spring itself carries no electrical current — its function is mechanical only. (See Fig. C. — above). The Mid Span Tap is molded of dimensionally stable polycarbonate resin. It can be positioned to receive interconnection from either side of the cable.



**Male Connector
for Flat Conductor Cable**

Ansley utilizes the conductor itself, which is selectively gold plated, for contact. This eliminates increased resistance points. The gold plated contact area of the Flat Conductor Cable is folded and locked into the male connector (see Fig. B. above). Conductor blade makes firm contact with female receptacle. Polarity key and security locks* provide proper mating. Circuit identification numbers are molded onto the connector.

A	B	C	D	PITCH	NO. COND.	CARD OR CABLE WIDTH E
2.00	1.62	.80	1.19	.050 .075 .100	14 9 7	.800 ±.005
2.50	2.12	1.30	1.69	.050 .075 .100	24 16 12	1.300 ±.005
2.80	2.42	1.60	1.99	.050 .075 .100	30 20 15	1.600 ±.005
3.50	3.12	2.30	2.69	.050 .075 .100	44 29 22	2.300 ±.005
4.10	3.72	2.90	3.29	.050 .075 .100	56 37 28	2.900 ±.005
4.30	3.92	3.10	3.49	.050 .075 .100	60 40 30	3.100 ±.005
4.90	4.52	3.70	4.09	.050 .075 .100	72 48 36	3.700 ±.005
5.83	5.45	4.63	5.02	.050 .075 .100	91 60 45	4.630 ±.005
6.30	5.92	5.10	5.49	.050 .075 .100	100 67 50	5.100 ±.005

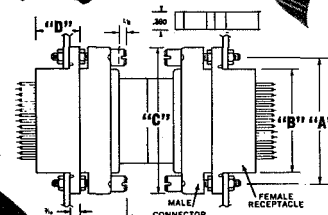
Other pitch dimensions are also available.

Ansley Expandable Rack and Panel Connector System

A complete assembly for test equipment racks, computers, instrumentation banks, and data processing equipment and machinery which requires movement of the chassis and occasional disconnection. The Ansley Expandable Rack and Panel Connector System consists of a coiled length of Flat Conductor Cable with connectors at either end. One end is connected to the rack and the other to the movable or sliding chassis. As the chassis is withdrawn, the coil unwinds — as the chassis is returned, slack is automatically taken up. There is no possibility of jamming, pinching, rubbing or interfering with the chassis. There is no misalignment or sagging. No mechanical devices, such as springs or pulleys are necessary. The tension of the built-in memory of the polyester is sufficient to eliminate any sag, even when fully extended. For quick disconnection, quarter-turn fasteners are also available as security lock.

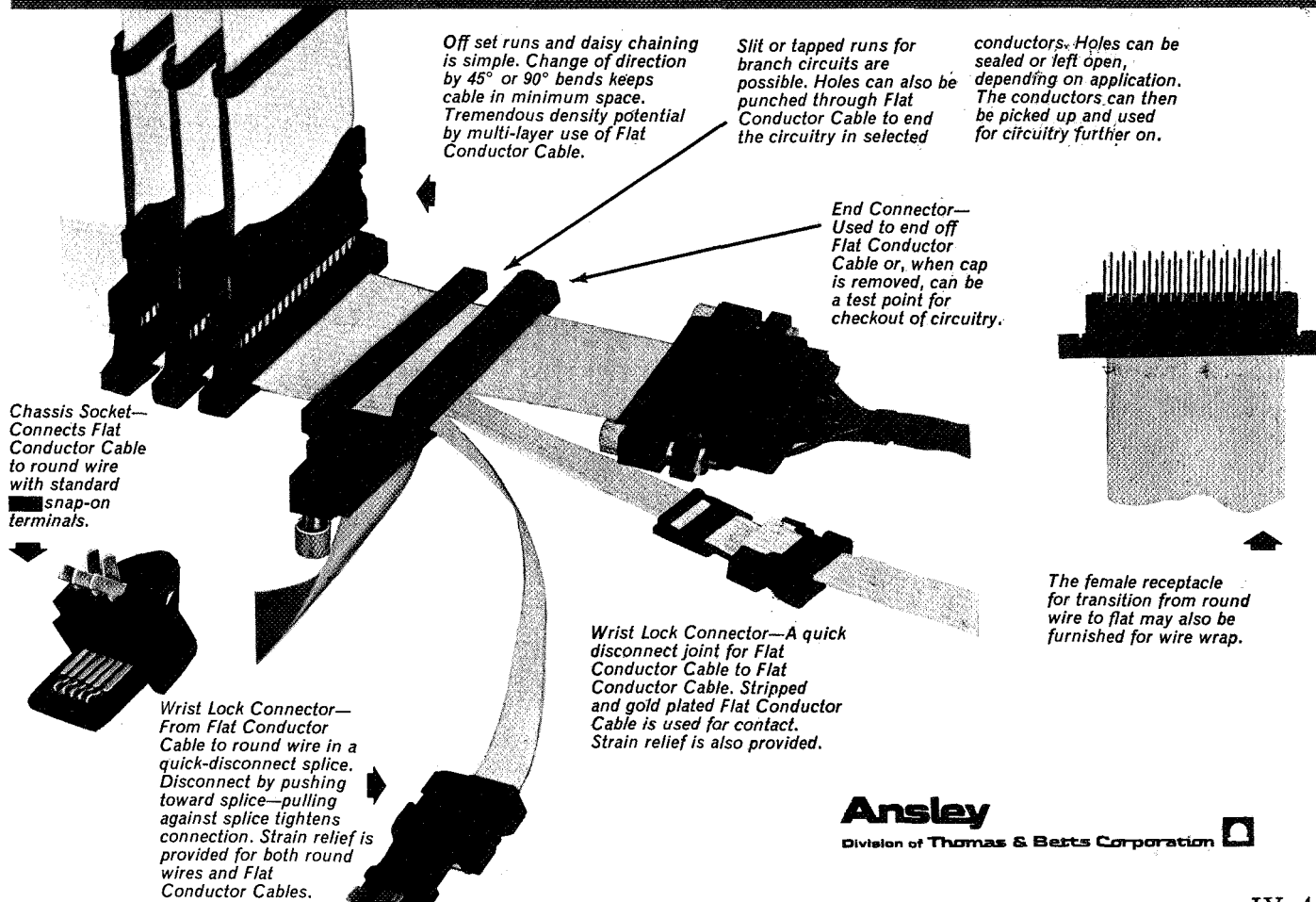
Capacity: 0.75 amps per conductor
Voltage breakdown: 3000 V
Resistance, Voltage Drop or ohms
per foot equal to #25 AWG.

Photo shows 108
conductors
in 3 layers



Number of Conductors	Cable Width ±0.005	Dimensions				Part No.* Entire assembly; Extension length, 24"; With contacts attached to 24" round wire leads and installed in female receptacle. Leads are 20 gage, with 0.030 PVC insulation, stripped at loose-end.
		"A"	"B"	"C"	"D"	
15	1.600	2.420	1.990	2.800	.900	600151
22	2.300	3.120	2.690	3.500	.830	600221
28	2.900	3.720	3.290	4.100	.900	600281
30	3.100	3.920	3.490	4.300	.830	600301
36	3.700	4.520	4.090	4.900	.900	600361

*Contact terminals and hand crimping tool available for assemblies furnished without round wires.



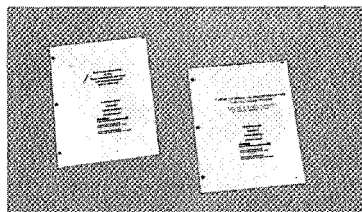
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There are Ansley Representatives in all major industrial areas throughout the country. They will show you the advantages and cost savings of Ansley Flat Wiring Systems. They will work with you in the application of Ansley's advanced techniques for interconnection wiring.

Other
Ansley
Literature



Bulletin E-6 — describes Ansley Signaflo Multi-Conductor Signal Transmission Line Systems. Controlled impedance values — cross-talk — propagation velocity and capacitance are built into systems which replace coax and twisted pairs, achieving comparable results with greater packaging density.



Bulletin E-9 — a technical paper presented at a joint IPC—EDN Flat Cable Seminar by the leading authority on "Flat Cable in the Transmission Line Field."

Bulletin E-11 — a technical paper, "Electrical Performance of Flat Cable Interconnection Wiring in Fast Rise Time Pulse Applications", presented to Flat Cable Symposium of IPC, September 1969.

Ansley
your one source
for advanced
interconnector
wiring



Reprint of an article appearing in Electronic Packaging & Production magazine covering the application of Ansley Transmission Line Systems to one computer manufacturer's equipment.



Bulletin E-10 describes Ansley Free-Flex Flexible Etched Circuitry . . . rigid circuitry and Ansley Perma-Flush™ Switch Decks and Code Wheels. Materials, line widths and tolerances, termination methods, platings and design advantages are explained.

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Division of Thomas & Betts Corporation



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TWX 910-321-3939

Ansley

PLUG-IN DIP SOCKET CABLE JUMPERS

for highest packaging density and wiring versatility

Ansley DIP socket jumper cable assemblies offer an outstanding combination of high packaging density, maximum wiring versatility and lowest installed cost.

Essentially the jumper assembly comprises a specified length of Ansley flat, flexible cable with low profile connectors. Thanks to the considerable weight and space savings of these jumpers, maximum packaging density is achieved.

Low Profile. The glass-filled connectors used for Ansley jumpers measure less than 1/4" thick, providing the lowest profile available. Cable profile is also extremely low with 0.010" as standard. All leads are flat to permit wave soldering on boards.

Choice of Configuration. Ansley jumpers can be provided with any number of connectors per cable, spaced as closely as every 1/2"—uniformly or at random. Various connector configurations and pin orientations are also available. As desired, the cable can exit from either side of the connector and, unlike any other jumper assembly, can exit at a 90° angle from the connector without increasing connector width.

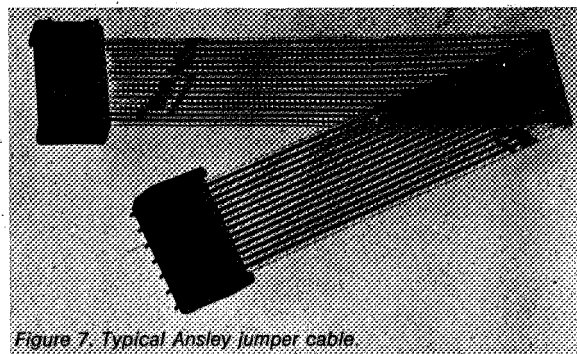
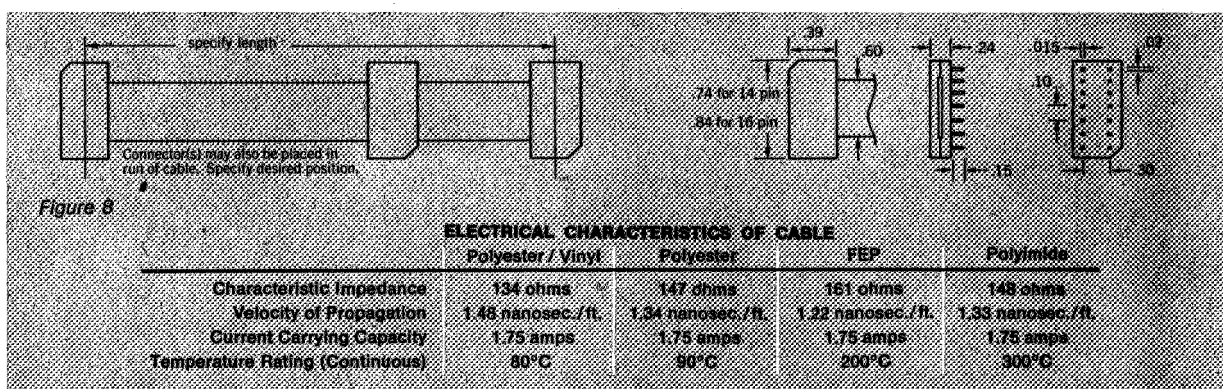


Figure 7. Typical Ansley jumper cable.

A Complete Assembly. Ansley jumpers are furnished completely assembled, tested and ready to plug in. Connections are mass bonded for highest reliability.

Wide Variety of Materials. Standard cable is 0.60" wide x 0.01" thick with 14 or 16 flat conductors on 0.040" centers. Available dielectrics include polyester/vinyl, polyester, FEP Teflon and polyimide. Standard contacts are phosphor bronze, gold plated over nickel flash.



Ordering Information for Ansley Jumper Cables

To order an Ansley Jumper Cable Assembly, please use the basic part number plus four dash numbers.

Basic Part Number: 614 14 lead cable assembly
616 16 lead cable assembly

First Dash Number: Dielectric material.

—P Polyester/vinyl —F FEP Teflon
—M Polyester —K Polyimide

Second Dash Number: Total length in inches from centerline of connectors.

Third Dash Number: Quantity of connectors.

Fourth Dash Number: Orientation of connectors on cable (refer to Figure 9.)

For example, to order an 8" long, 14 lead cable assembly with polyester/vinyl dielectric, and two connectors, each with pins down, numbered L to R, use part number 614-P-8-2-AA.

NOTE: When more than two connectors per cable are required, please specify locational dimensions.

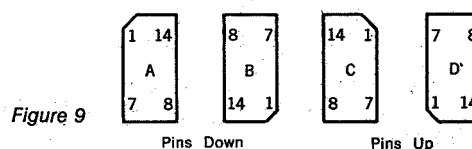


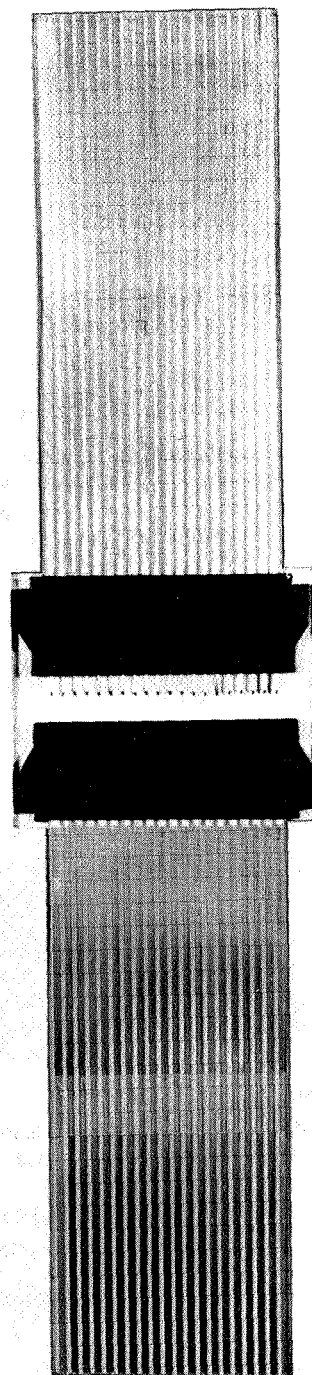
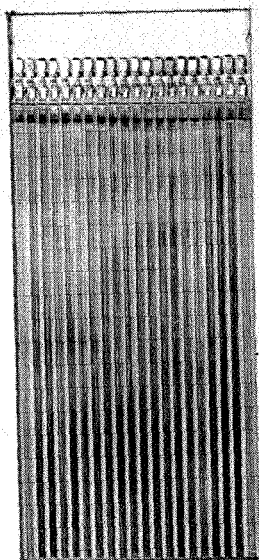
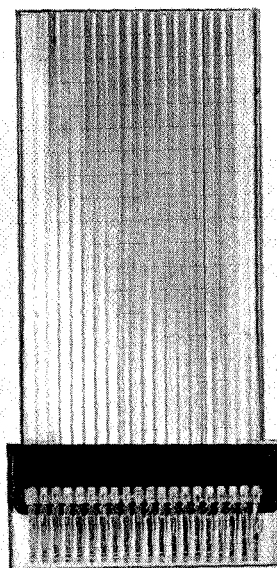
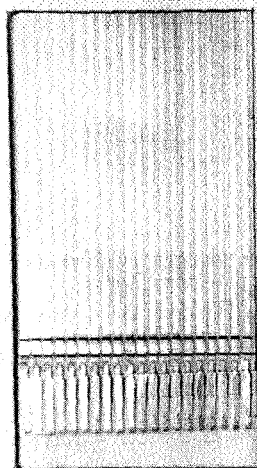
Figure 9

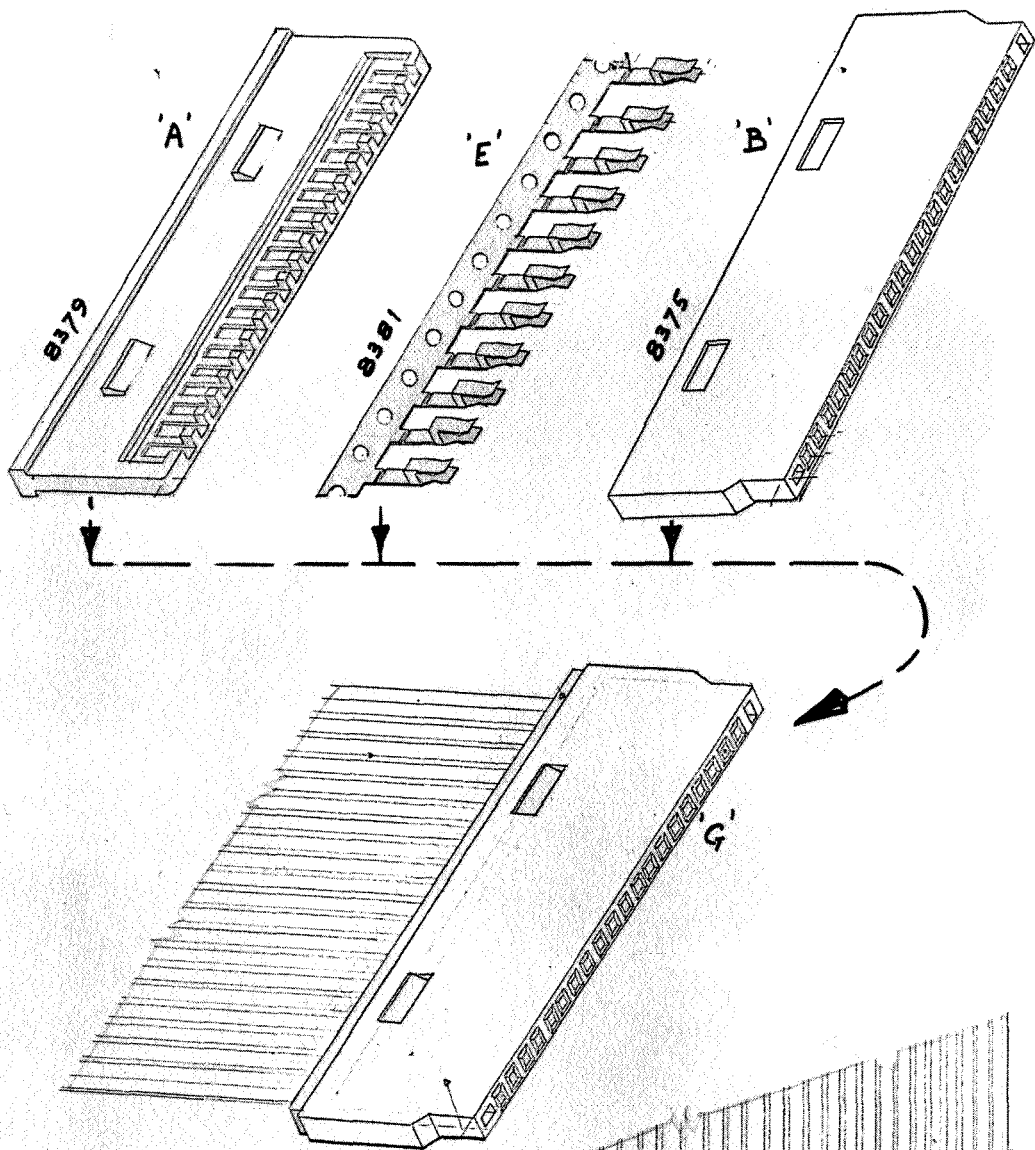
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4100 N. FIGUEROA ST. / LOS ANGELES, CAL. 90065 / (213) 223-2331
IN EUROPE: ANSLEY ELEKTRONIK, GmbH, 8766 GROSSHEUBACH

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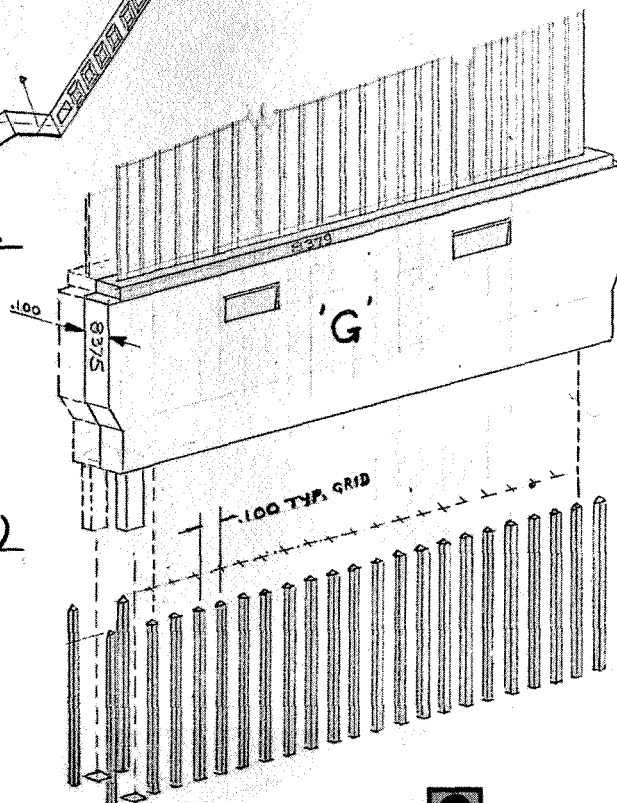
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CONNECTOR, SOCKET,
20 POSITIONS, FOR .025 PINS.

TYPICAL APPLICATION →
CABLE TO BACK PANEL,
(.025 SQ. WIRE WRAP PINS)



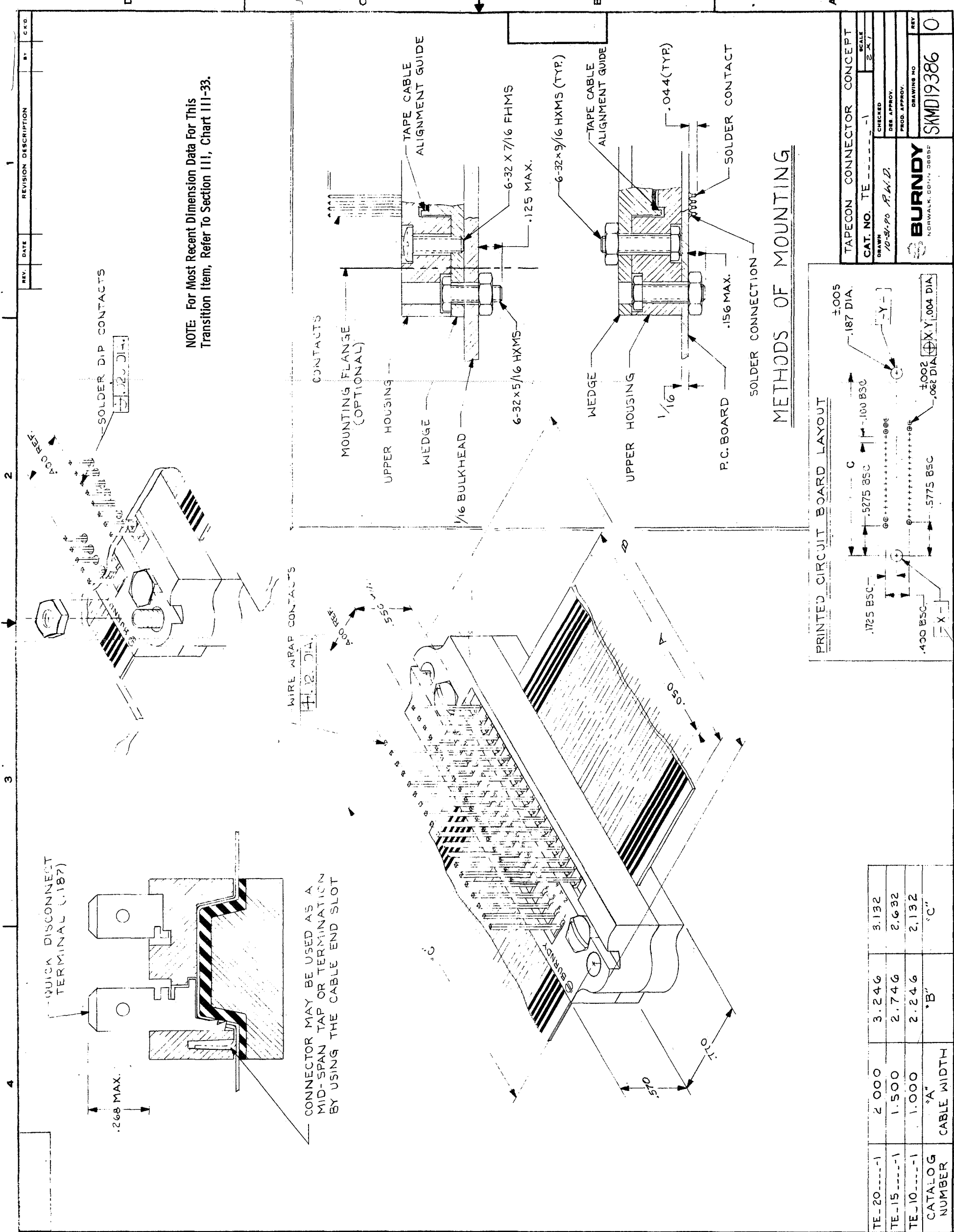
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BURNDY







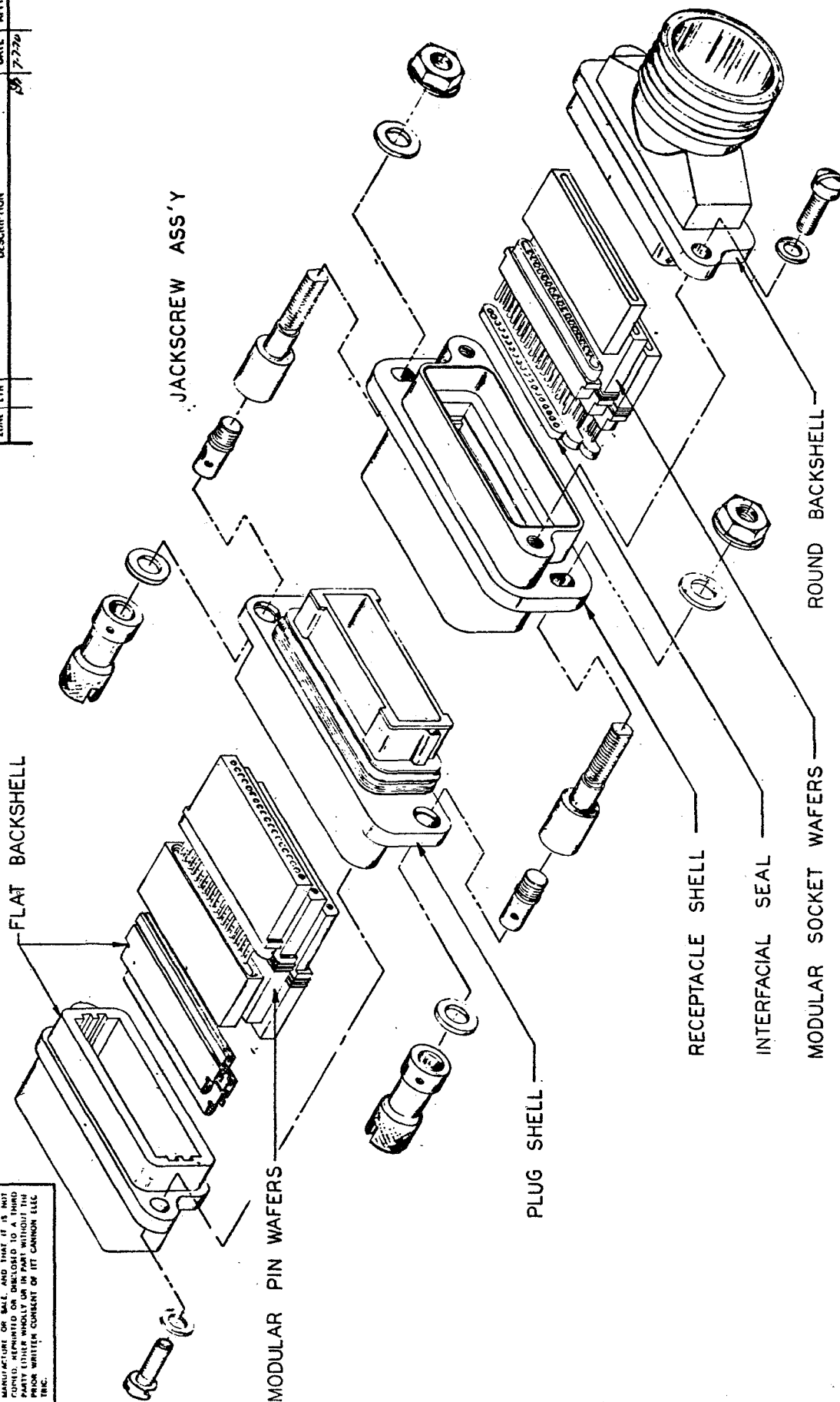
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REVISIONS

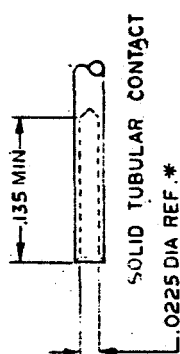
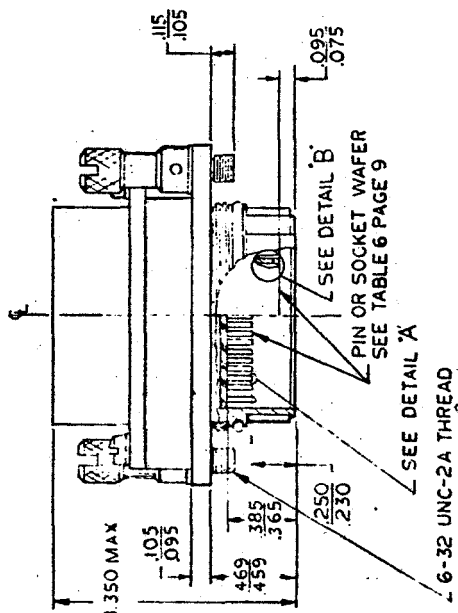
ZONE	DATE	APPROVED
1	7-7-70	



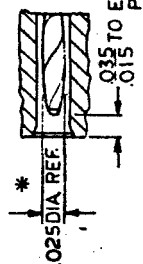
REFERENCE	ME 8099	INTENDED USE	CUSTOMER	PART NUMBER
DIMENSIONS IN INCHES TOLERANCES FOR DECIMALS AND FRACTIONS ARE SHOWN DO NOT SLAT	J. LEROUX	6-8-70	ITT CANNON ELECTRIC	
CHECKED	7/1/70		FLAT CABLE CONNECTOR	
APPROVED	J. L. VADEN	6-8-70	SERIES A & B, 3 WAFER MODEL	
APPROVED	A. R. ERBE	6-8-70	SIZE	COUL IDENT NO
			C 71468	25748 Y
			SCALE	WT.
				SHEET 1 OF 11

THIS CONNECTOR DESIGNED SPECIFICALLY TO MEET OR EXCEED
THE REQUIREMENTS OF MIL-C-55544

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MANUFACTURE OR SALE, AND THAT IT IS NOT
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PARTY EITHER WHOLLY OR IN PART WITHOUT THE
PRIOR WRITTEN CONSENT OF ITT CANNON ELEC-
TRIC.



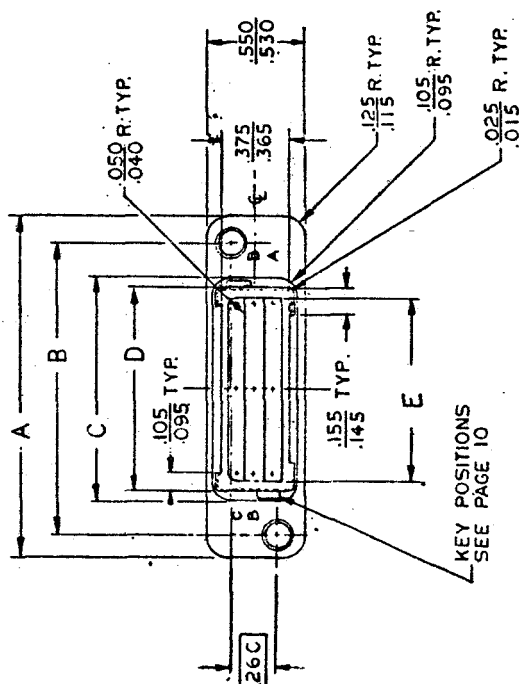
DETAIL A SOCKET



DETAIL B PIN

TABLE 1

ITT CANNON PART NO.	A	B	C	D	E
FC *IB *****	1.450	1.175	.780	.660	.580
FC *IC *****	1.900	1.625	1.230	1.110	1.030
FC *ID *****	2.400	2.125	1.730	1.610	1.530
FC *IE *****	2.900	2.625	2.230	2.110	2.030
FC *IF *****	3.400	3.125	2.730	2.610	2.530
FC *IG *****	3.900	3.625	3.230	3.110	3.030



* SPRING MEMBER IS ON CONTACT PIN.
CONTACT PIN DIAMETER .025 MAY BE VARIED TO
PROVIDE A MAX ENGAGING FORCE OF 6 OZ
AND A MIN. SEPARATION FORCE OF 1/2 OZ.

REFERENCE ME 8099	INTENDED USE CUSTOMER	PART NUMBER
DIMENSIONS IN INCHES, TOLERANCES FOR DECIMALS AND ANGLES AS SHOWN DO NOT SCALE	DRAWN J LEROUX	8-12-69
MATERIAL	CHECKED R. Waller	7/12/70
FINISH	APPROVED J. P. Vaden	8-15-69
TREATMENT	APPROVED M. E. Eide	7/14/70
PLUG, FLAT BACKSHELL (FOR FLAT CABLE OR ROUND WIRE)		SIZE C 71468
CODE IDENT NO.		25748 Y
SCALE	WT.	SHEET 3 OF 11

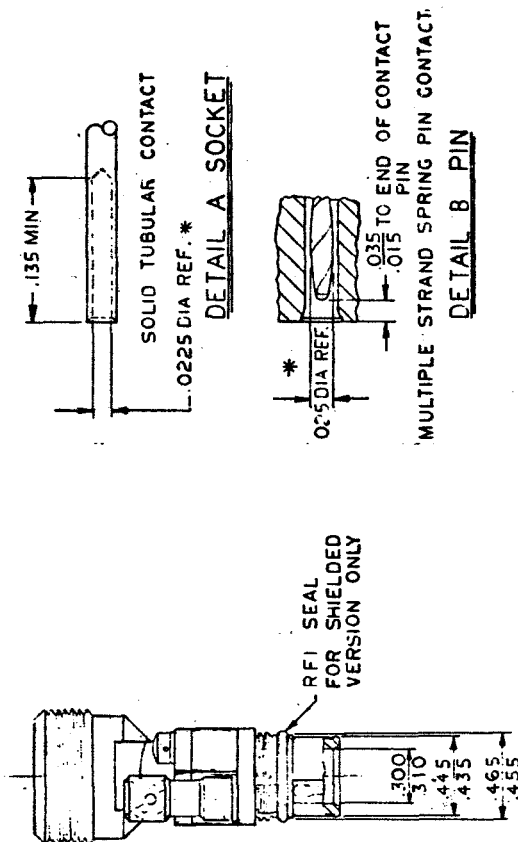
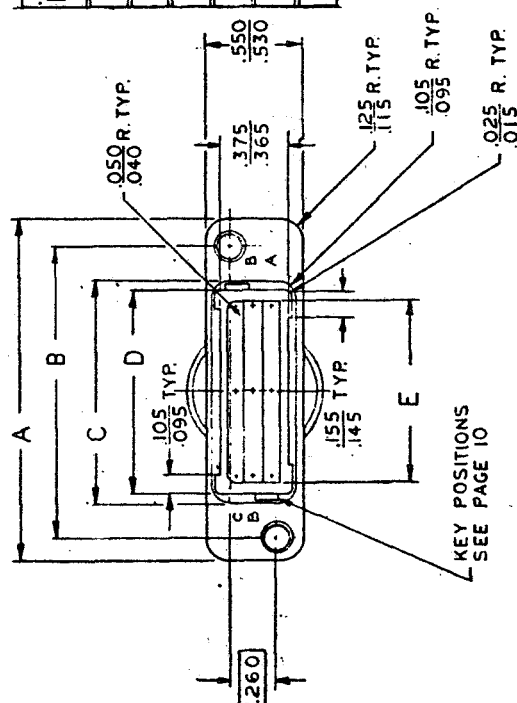



TABLE II

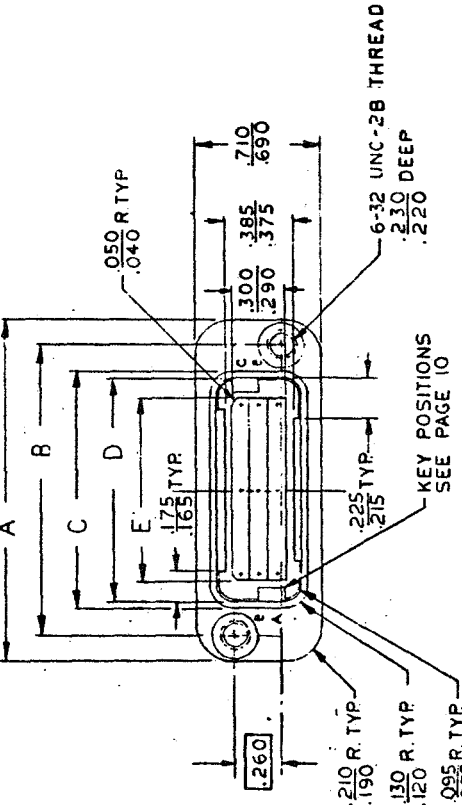
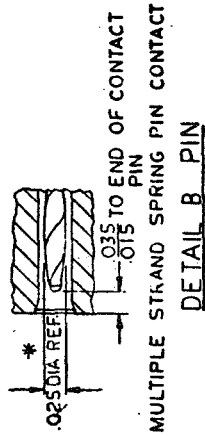
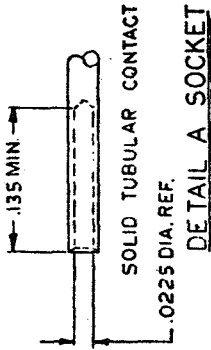
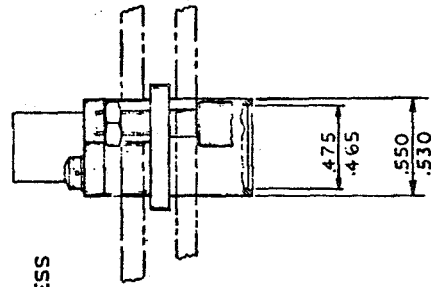
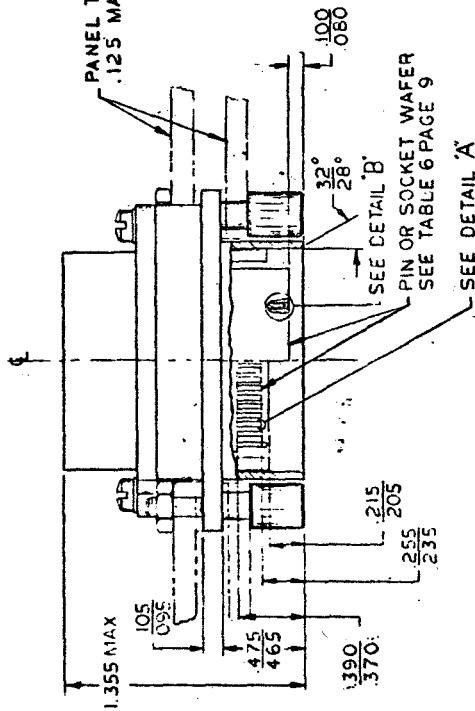
ATT CANNON PART NO.	A ± .005	B BASIC	C ± .005	D ± .005	E ± .005	F MAX.	G THREAD
FC #2B *** *	1.450	1.175	.780	.660	.580	1.660	5/8-24 UNEF 2A
FC #2C *** *	1.900	1.625	1.230	1.110	1.030	1.740	3/4-20 UNEF 2A
FC #2D *** *	2.400	2.125	1.730	1.610	1.530	1.840	7/8-20 UNEF 2A
FC #2E *** *	2.900	2.625	2.230	2.110	2.030	1.950	1-20 UNEF 2A
FC #2F *** *	3.400	3.125	2.730	2.610	2.530	2.050	1 1/8-18 UNEF 2A
FC #2G *** *	3.900	3.625	3.230	3.110	3.030	2.120	1 1/2-18 UNEF 2A



* SPRING MEMBER IS ON CONTACT PIN.
CONTACT PIN DIAMETER .025 MAY BE VARIED TO
PROVIDE A MAX ENGAGING FORCE OF 6 OZ
AND A MIN. SEPARATION FORCE OF 1/2 OZ.

REFERENCE	ME 8099		INTENDED USE	CUSTOMER		PART NUMBER		
DIMENSIONS IN INCHES, TOLERANCES IN PARENT ANGLES AND ROUNDS AND ANGLES SHOWN DO NOT SCALE	<div style="border: 1px solid black; width: 100%; height: 100%; position: relative;"> <div style="position: absolute; top: 0; left: 0; right: 0; bottom: 0; border: 1px solid black;"></div> </div>		DRAWN	J LEROUX	8-12-69	 ITT CANNON ELECTRIC <small>11000 Union Boulevard, Detroit, Mich. 48211</small> <small>A Division of International Telephone and Telegraph Corporation</small>		
			CHECKED	<i>R. Wells</i>	7/2/70			
			APPROVED	<i>J. H. H.</i>	8-16-69			
			APPROVED	<i>J. P. H.</i>	7-27-70			
MATERIAL						PLUG ROUND BACKSHELL (FOR SHIELDED ROUND WIRE)		
FINISH					SIZE			CODE IDENT NO.
TREATMENT					C			71468
							25748 Y	
						SCALE	— —	
						WT.	SHEET 4 OF 11	

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CORPORATION.



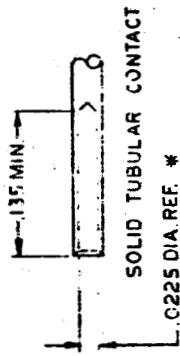
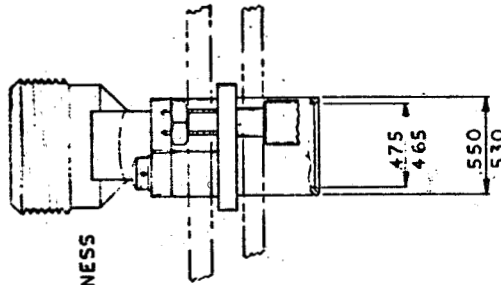
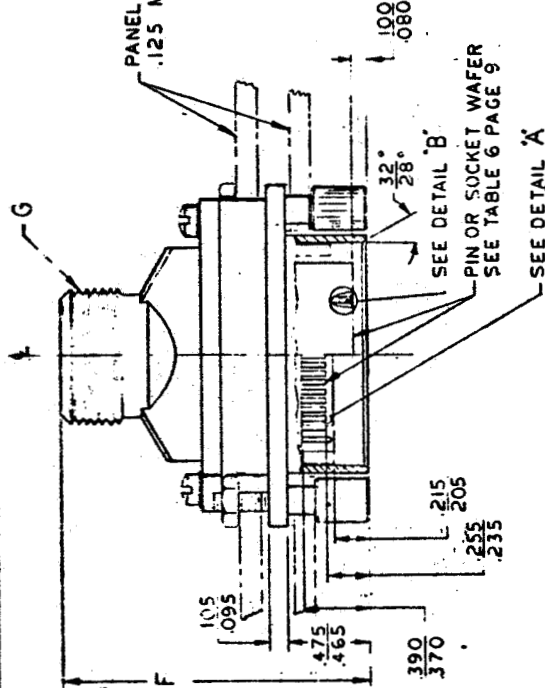
* SPRING MEMBER IS ON CONTACT PIN.
CONTACT PIN DIAMETER .025 MAY BE VARIED TO
PROVIDE A MAX ENGAGING FORCE OF 6 OZ
AND A MIN SEPARATION FORCE OF 1/2 OZ.

TABLE III

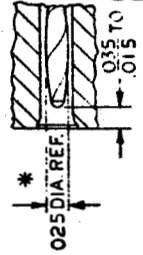
ITT CANNON PART NO.	A	B	C	D	E
FC #3B *** * *	± .005	BASIC	± .005	± .005	± .005
FC #3C *** * *	1.450	1.175	.870	.790	.575
FC #3D *** * *	1.900	1.625	1.320	1.240	1.025
FC #3E *** * *	2.400	2.125	1.820	1.740	1.525
FC #3F *** * *	2.900	2.625	2.320	2.240	2.025
FC #3G *** * *	3.400	3.125	2.820	2.740	2.525
FC #3H *** * *	3.900	3.625	3.320	3.240	3.025

REFERENCE	ME 8099	INTENDED USE	CUSTOMER	PART NUMBER
DIMENSIONS IN INCHES TOLERANCES AND ANGLES AS SHOWN DO NOT SCALE		DRAWN	J LEROUX	8-12-69
MATERIAL		CHECKED	R. Waller	7/2/70
FINISH		APPROVED	J. V. Veda	8-15-69
TREATMENT		APPROVED	A. P. Chalk	7/2/70
ITT CANNON ELECTRIC 2100 Main Street, Los Angeles, Calif. 90015 A Division of International Telephone and Telegraph Corporation		RECEPTACLE, FLAT BACKSHELL (FOR FLAT CABLE OR ROUND WIRE)		
SIZE		CODE IDENT NO.	C 71468 25748 Y	
SCALE		WT.	SHEET 5 OF 11	

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ELECTRIC, INC.



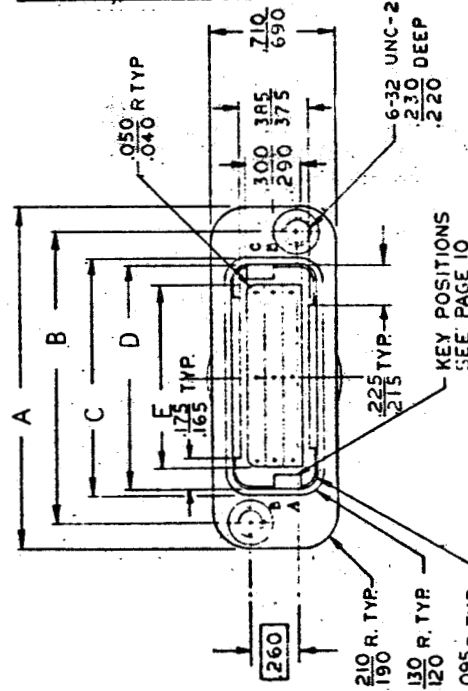
DETAIL A SOCKET



DETAIL B PIN

TABLE IV

ITT CANNON PART NO	A	B	C	D	E	F	G
	± .005	BASIC	± .005	± .005	± .005	MAX.	THREAD
FC #4B *** ** *	1.450	1.175	.870	.790	.575	1.660	5/8-24 UNEF 2A
FC #4C *** ** *	1.900	1.625	1.320	1.240	1.025	1.740	3/4-20 UNEF 2A
FC #4D *** ** *	2.400	2.125	1.820	1.740	1.525	1.840	7/8-20 UNEF 2A
FC #4E *** ** *	2.900	2.625	2.320	2.240	2.025	1.950	1-20 UNEF 2A
FC #4F *** ** *	3.400	3.125	2.820	2.740	2.525	2.050	1 1/8-18 UNEF 2A
FC #4G *** ** *	3.900	3.625	3.320	3.240	3.025	2.120	1 1/2-18 UNEF 2A



* SPRING MEMBER IS ON CONTACT PIN.
CONTACT PIN DIAMETER .025 MAY BE VARIED TO
PROVIDE A MAX ENGAGING FORCE OF 6 OZ
AND A MIN SEPARATION FORCE OF 1/2 OZ.

PART NUMBER

INTENDED USE

CUSTOMER

REFERENCE

ME 8099

DRAWN

CHECKED

APPROVED

DATE

APPROVED

DATE

APPROVED

		RECEPTACLE ROUND BACKSHELL (FOR SHIELDED ROUND WIRE)	
DRAWN J. LEROUX	CHECKED 	DATE 8-12-69	PART NUMBER
MATERIAL 	FINISH 	TREATMENT 	SIZE
APPROVED 	APPROVED 	APPROVED 	APPROVED
CODE IDENT NO. C 71468		25748 Y	
SCALE 		SHEET 6 OF 11	

THIS IS A REVISION OF THE PREVIOUS EDITION OF THIS DRAWING. IT IS NOT TO BE USED AS A BASIS FOR MANUFACTURE OR SALE, AND THAT IT IS NOT TO BE USED AS A BASIS FOR MANUFACTURE OR SALE WITHOUT THE PRIOR WRITTEN CONSENT OF ITT CANNON ELECTRIC CO.

REVISION	DESCRIPTION	DATE	APPROVED
1	1/11		

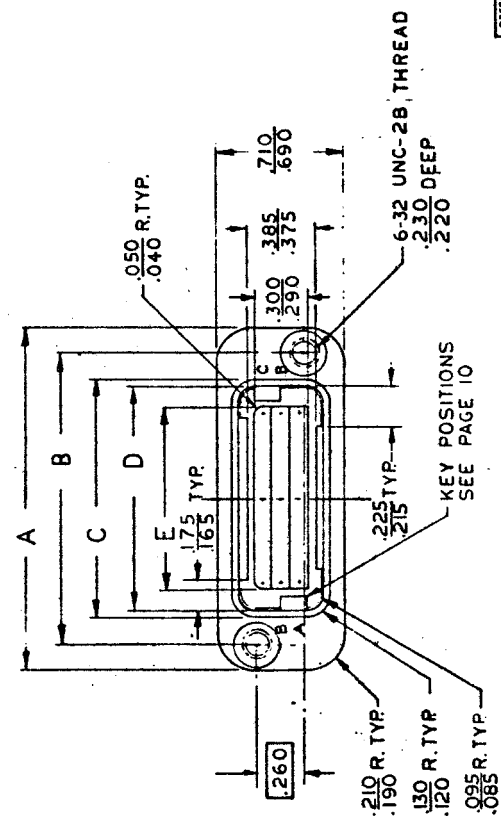
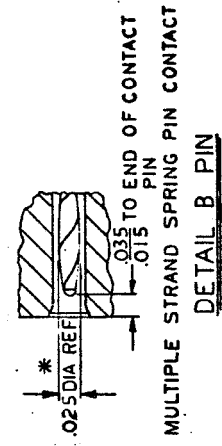
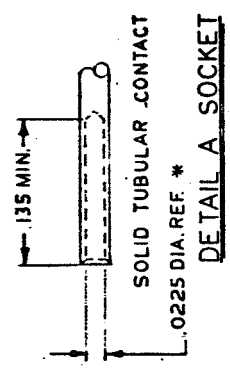
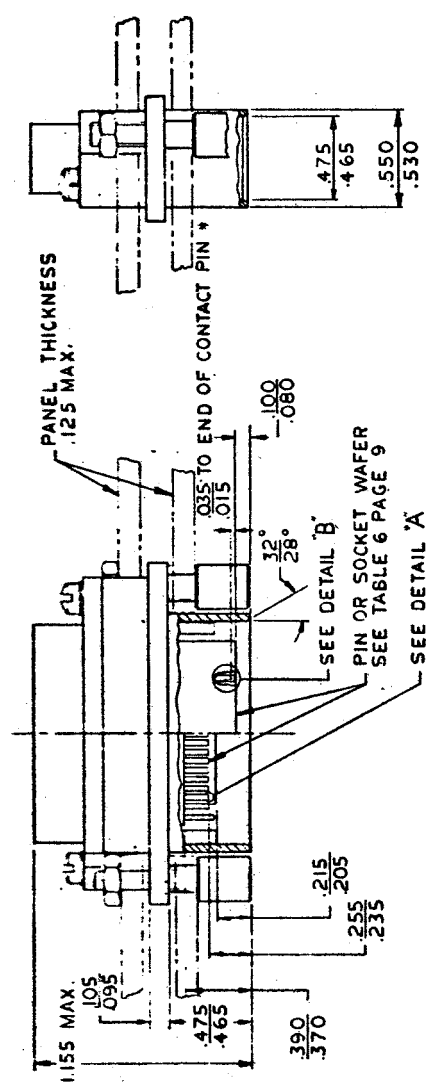


TABLE V

ITT CANNON PART NO.	A	B	C	D	E
FC #5B *** *	± .005	BASIC	± .005	± .005	± .005
FC #5C *** *	1.450	1.175	.870	.790	.575
FC #5D *** *	1.900	1.625	1.320	1.240	1.025
FC #5E *** *	2.400	2.125	1.820	1.740	1.525
FC #5F *** *	2.900	2.625	2.320	2.240	2.025
FC #5G *** *	3.400	3.125	2.820	2.740	2.525
FC #5H *** *	3.900	3.625	3.320	3.240	3.025

* SPRING MEMBER IS ON CONTACT PIN.
 CONTACT PIN DIAMETER .025 MAY BE VARIED TO PROVIDE A MAX ENGAGING FORCE OF 6 OZ AND A MIN SEPARATION FORCE OF 1/2 OZ.

REFERENCE ME 8099	INTENDED USE CUSTOMER	PART NUMBER
DIMENSIONS IN INCHES. TOLERANCES FOR DECIMALS AND FRACTIONS ARE SHOWN DO NOT SCALE	DRAWN J LEROUX	8-13-69
MATERIAL	CHECKED J. L. LEROUX	7/26/70
FINISH	APPROVED J. L. LEROUX	8-15-69
TREATMENT	APPROVED J. L. LEROUX	7/27/70
ITT CANNON ELECTRIC A Division of International Telephone and Telegraph Corporation RECEPTACLE, BOX BACKSHELL (FOR FLAT CABLE OR ROUND WIRE)		SIZE CODE IDENT NO. C 71468 25748 Y
SCALE		WT.
SHEET 7 OF 11		

THIS IS SUBJECT TO VARIATION IN DIMENSIONS OF THE MANUFACTURING PROCESS, AND THAT IT IS NOT GUARANTEED TO BE THE SAME AS THE DIMENSIONS SHOWN ON THE DRAWING. THE PARTS WILL BE ACCEPTED BY THE CUSTOMER ONLY IF THEY MEET THE DIMENSIONS SHOWN ON THE DRAWING.

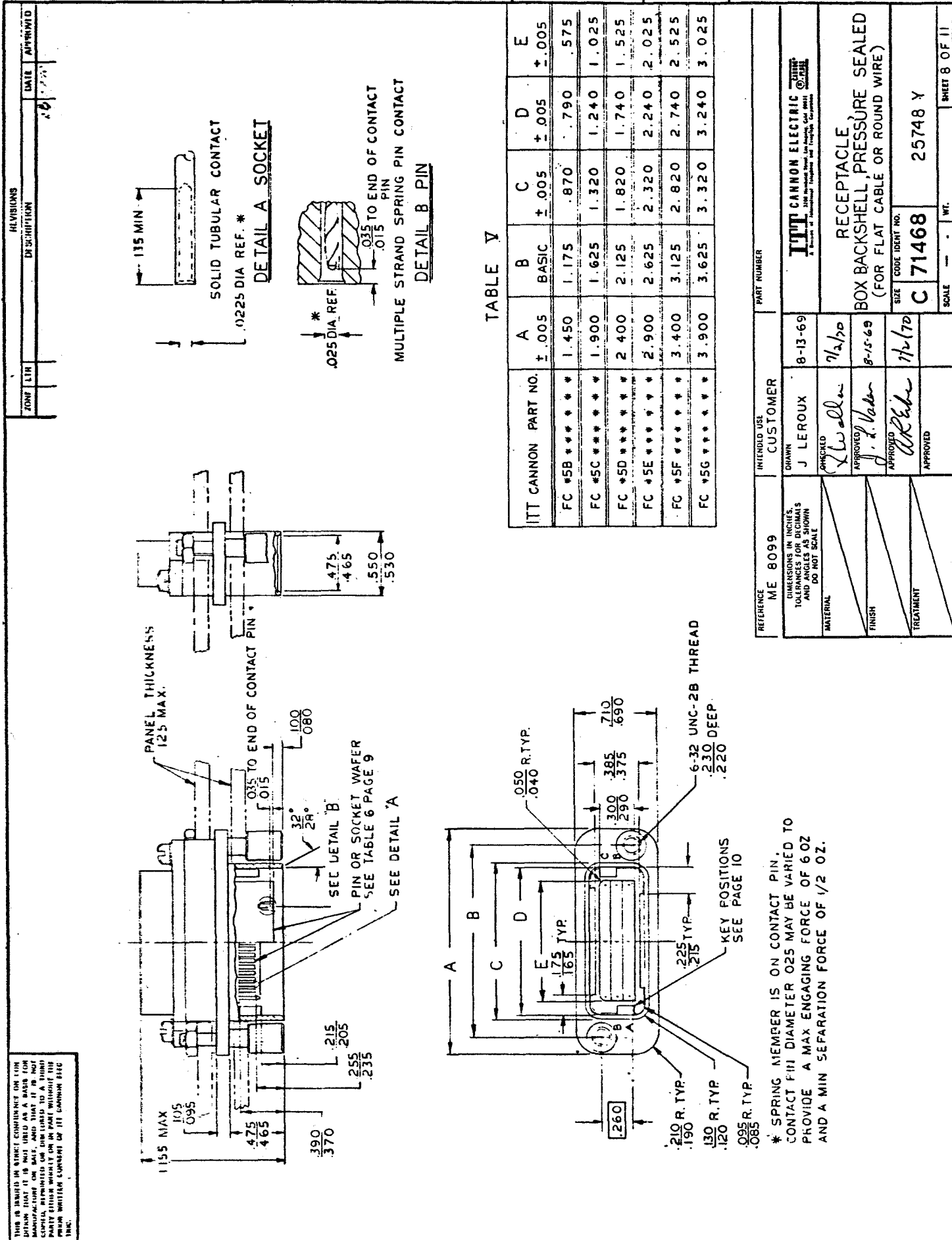


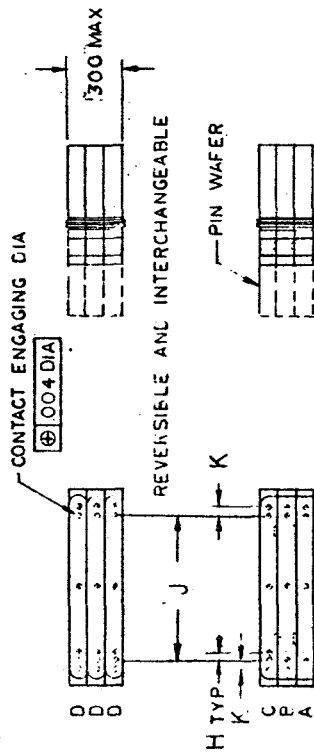
TABLE V

ITT CANNON PART NO.	A	B	C	D	E
FC *5B *** **	± .005	BASIC	± .005	± .005	± .005
FC *5C *** **	1.450	1.175	.870	.790	.575
FC *5D *** **	1.900	1.625	1.320	1.240	1.025
FC *5E *** **	2.400	2.125	1.820	1.740	1.525
FC *5F *** **	2.900	2.625	2.320	2.240	2.025
FC *5G *** **	3.400	3.125	2.820	2.740	2.525
FC *5H *** **	3.900	3.625	3.320	3.240	3.025

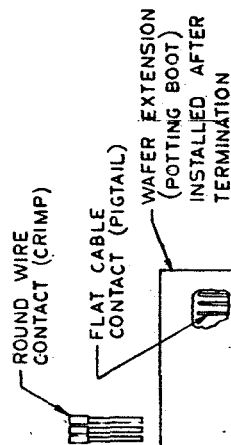
REFERENCE	ME 8099	INTENDED USE	CUSTOMER	PART NUMBER
DIMENSIONS IN INCHES, TOLERANCES FOR DECIMALS AND FRACTIONS ARE SHOWN ON DRAWING	J LEROUX	8-13-69	ITT CANNON ELECTRIC	
MATERIAL	APPROVED	7/2/70	RECEPTACLE, BOX BACKSHELL, PRESSURE SEALED (FOR FLAT CABLE OR ROUND WIRE)	
FINISH	APPROVED	8-15-69	SIZE	CODE IDENT NO.
TREATMENT	APPROVED	11/2/70	C 71468	25748 Y
			SCALE	WT.
				SHEET 8 OF 11

* SPRING MEMBER IS ON CONTACT PIN. CONTACT PIN DIAMETER .025 MAY BE VARIED TO PROVIDE A MAX ENGAGING FORCE OF 6 OZ AND A MIN SEPARATION FORCE OF 1/2 OZ.

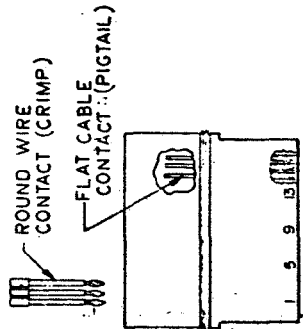
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POLARIZED AND POSITIONED SOCKET WAFER



SOCKET WAFER ASSY
BASIC WAFER + SOCKET CONTACT



PIN WAFER ASSY
BASIC WAFER + PIN CONTACT

TABLE VI
WAFER ARRANGEMENT

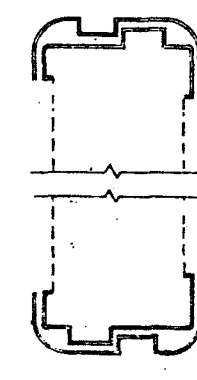
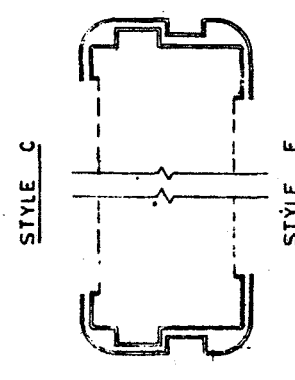
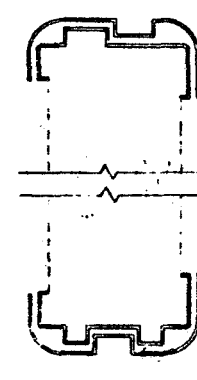
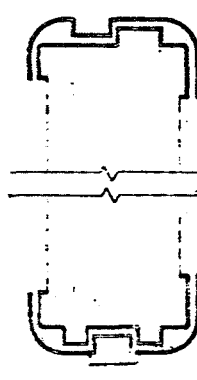
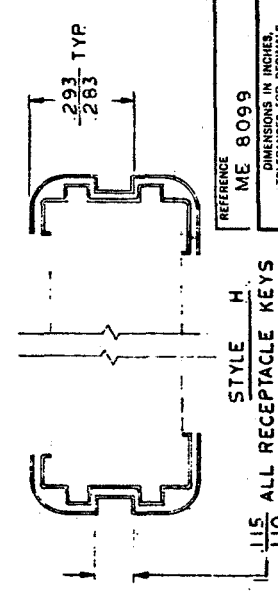
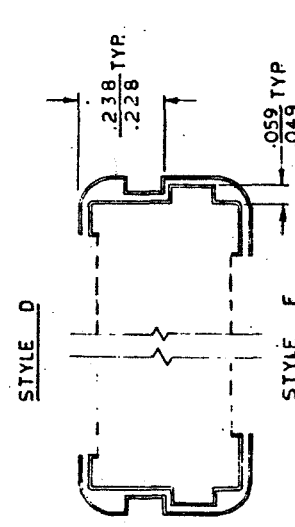
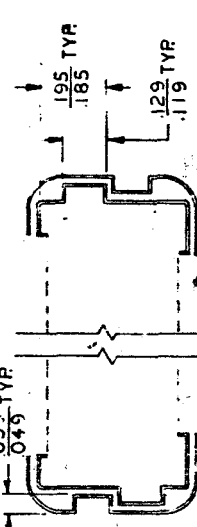
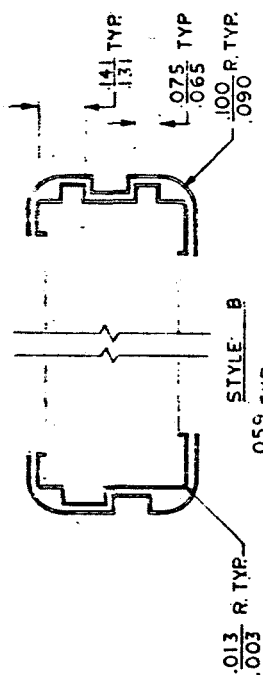
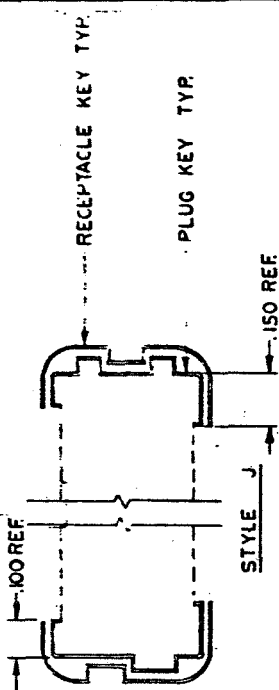
CABLE CONTACT WIDTH SPACING NO	NO. OF CONTACTS PER ROW	H	J	K	TOTAL CONTACTS PER NO OF CABLE LAYERS			MAX. MATING FORCE LBS SHELL ONLY	MAX. UNMATING FORCE LBS SHELL ONLY
					1	2	3		
500	2	050	300	0875	7	14	21		
500	3	075	375	0500	6	12	18	6	2
500	4	100	300	0875	4	9	12		
1,000	2	050	800	0625	17	34	51		
1,000	3	075	825	0500	12	24	36	8	4
1,000	4	100	800	0625	9	18	27		
1,500	2	050	1,700	0625	27	54	81		
1,500	3	075	1,275	0750	18	36	54	10	6
1,500	4	100	1,300	0625	14	28	42		
2,000	2	050	1,800	0625	37	74	111		
2,000	3	075	1,800	0625	25	50	75	12	8
2,000	4	100	1,800	0625	19	38	57		
2,500	2	050	2,300	0625	47	94	141		
2,500	3	075	2,325	0500	32	64	96	14	10
2,500	4	100	2,300	0625	24	48	72		
3,000	2	050	2,800	0625	57	114	171		
3,000	3	075	2,775	0750	38	76	114	16	12
3,000	4	100	2,800	0625	29	58	87		

* ADD 8 OZ. PER CONTACT FOR MATING AND 6 OZ. PER CONTACT FOR UNMATING TO THE FORCES SHOWN IN TABLE VI

REFERENCE ME 8099		INTENDED USE CUSTOMER		PART NUMBER	
DIMENSIONS IN INCHES TOLERANCES FOR DETAILS AND ANGLES AS SHOWN DO NOT SCALE		DRAWN J. LEROUX		8-13-69	
MATERIAL		CHECKED <i>Pluella</i>		7/6/70	
FINISH		APPROVED <i>J. Leroux</i>		8-5-69	
TREATMENT		APPROVED <i>Pluella</i>		7/6/70	
PIN AND SOCKET WAFER				SIZE CODE IDENT NO.	
				C 71468	
				25748 Y	
				SCALE — WT.	
				SHEET 9 OF 11	

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REVISIONS		DATE	APPROVED
ZONE	LTR		
DESCRIPTION			



REFERENCE		INTENDED USE		PART NUMBER	
ME 8099		CUSTOMER			
DIMENSIONS IN INCHES TOLERANCES FOR DECIMALS AND ANGLES AS SHOWN DO NOT SCALE		DRAWN	8-13-69	J. LEROUX	
MATERIAL		CHECKED	7/2/70	J. W. Allen	
FINISH		APPROVED	8-15-69	J. P. Vaden	
TREATMENT		APPROVED	7/4/70	J. P. Vaden	
		APPROVED			

STYLE H
ALL RECEPTACLE KEYS
JIT

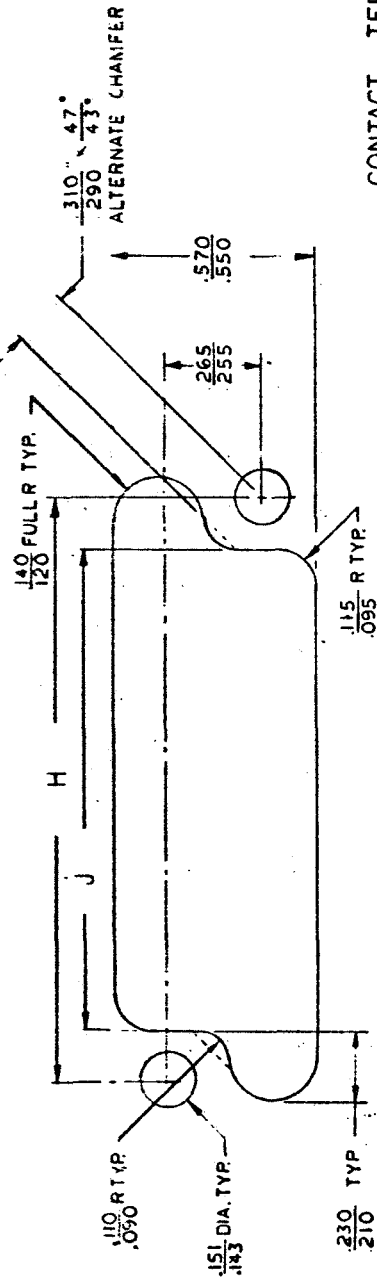
FRONT VIEW OF PLUG FACE SHOWN RECEPTACLE KEYS
SHOWN IN MATED CONDITION
NOTE:

KEYING POSITIONS

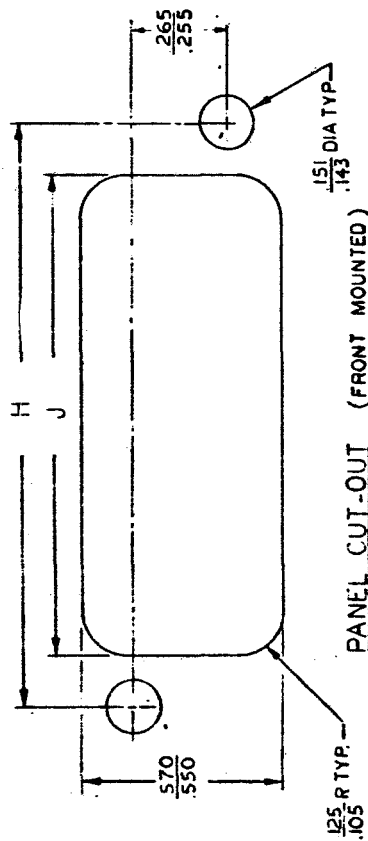
SIZE	CODE IDENT NO.	25748 Y
C	71468	
SCALE	WT.	SHEET 10 OF 11

ITC CANNON ELECTRIC
A Division of Cannon Corporation
1000 North Main Street, Lowell, Mass. 01851

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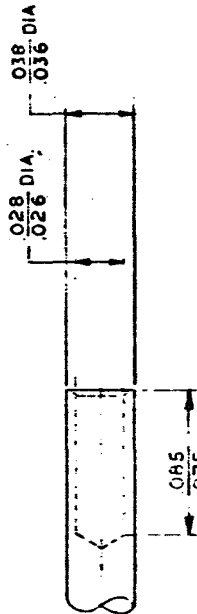


PANEL CUT-OUT (BACK MOUNTED)
(VIEW FACING EXTERIOR OF BOX OR PANEL FRONT TYP BOTH CUT-OUTS)

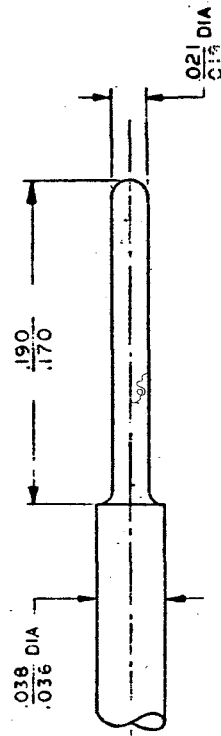


PANEL CUT-OUT (FRONT MOUNTED)

CONTACT TERMINATION DESIGN DATA



CRIMP TYPE CONTACT H, K, M, R



WELD OR LAP SOLDER TYPE CONTACT

TABLE VII
PANEL CUT-OUT

SHELL SIZE	H	J
B3	±.005	±.010
C3	1.175	.890
D3	1.625	1.340
E3	2.125	1.840
F3	2.625	2.340
G3	3.125	2.840
	3.625	3.340

FOR CONTACT INFORMATION REFER TO "MICRO D" TEST DATA IN ITT CANNON "MICROMINIATURE CONNECTORS" CATALOG.

NOTES: DIMENSIONS ON ALL SHEETS SUBJECT TO CHANGE

ZONE	LTR	DESCRIPTION	DATE	APPROVED
			12/1/77	

REFERENCE ME 8099	INTENDED USE CUSTOMER	PART NUMBER
DIMENSIONS IN INCHES, TOLERANCES FOR DECIMALS AND FRACTIONS ARE SHOWN AND DO NOT SCALE	DRAWN J. LEROUX	8-13-69
MATERIAL	CHECKED C. Wallace	7/2/70
FINISH	APPROVED J. P. Vase	8-15-69
TREATMENT	APPROVED W. B. J.	7/2/70
ITT CANNON ELECTRIC CORP. A Division of International Telephone and Telegraph Corporation		
PANEL CUT-OUT AND CONTACT TERMINATION		
SIZE	CODE IDENT NO.	25748 Y
C	71468	
SCALE	WT.	
		SHEET 11 OF 17



7

20

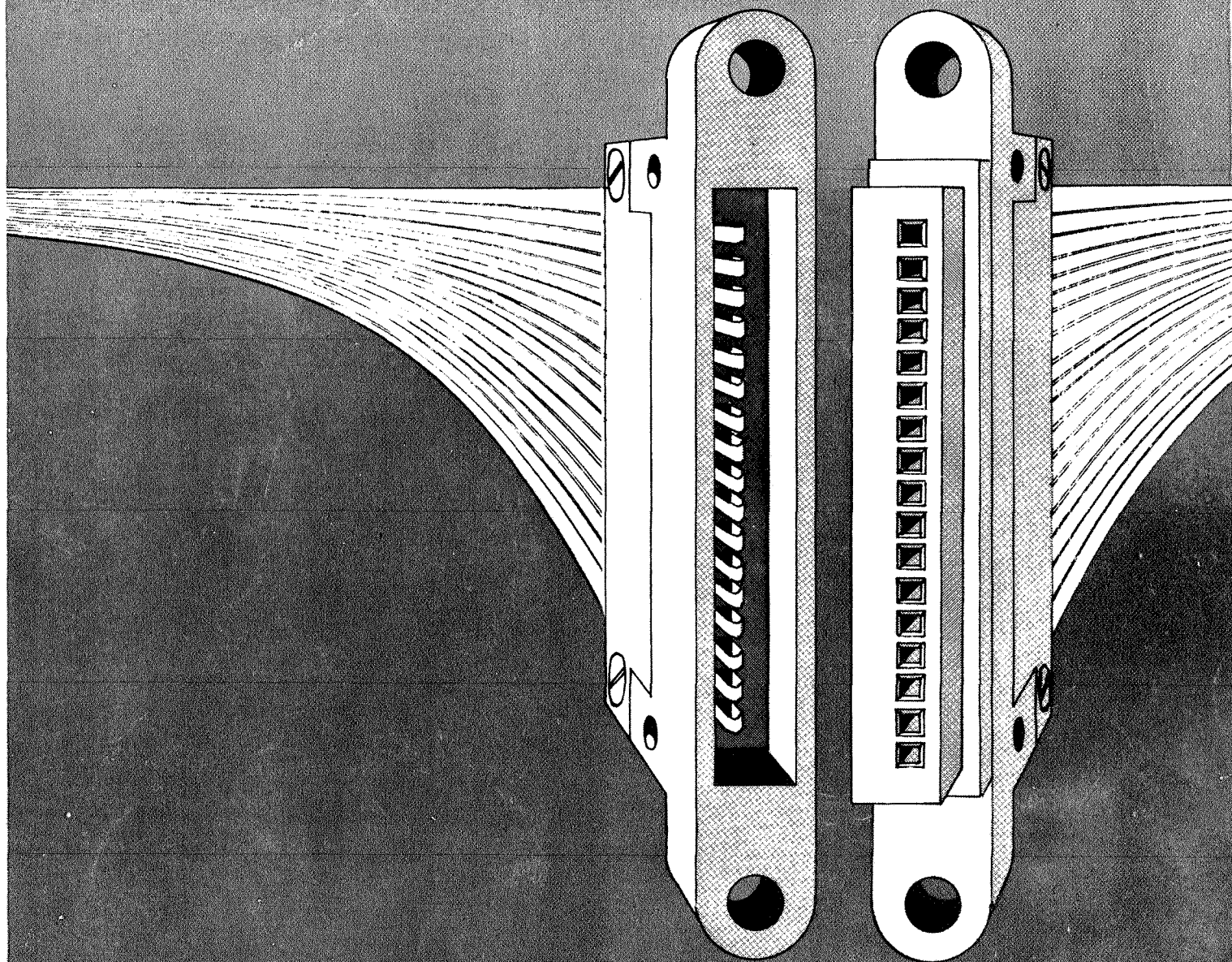


KINGS

 **KINGS**

Series 50

flat cable connectors



Connectors for flat center conductor or round center conductor (ribbon) cable on 50-mil centers.

- ☐ No special tool required
- ☐ Assembly: As easy as "A, B, C":
 - A. Cut cable end square (with razor blade, scissors, or shears).
 - B. Place cable into connector; position cable conductors with connector registration marks.
 - C. Screw clamp plate to connector.
- ☐ Field serviceable
- ☐ Replaceable contacts
- ☐ Weatherproof seals available

flat cable connectors

The new Series 50 Flat Cable Connectors have been specifically designed to satisfy the termination problem of flat and round conductor cables. These connectors can be used in military and commercial communications, computers, office equipment, aircraft, home entertainment systems and control systems.

Connector Types

- ☐ Flat Cable Plug
- ☐ Flat Cable Jack
- ☐ Printed Circuit Receptacle (50-mil centers, single-sided; 100-mil centers, staggered, double-sided)
- ☐ Wire Wrap
- ☐ Integrated Circuit Holder
- ☐ Terminal Junction Block
- ☐ Discrete Wire (Solder)

Performance

- ☐ Contact Resistance: 7 milliohms @ 1 ampere
- ☐ Current Capability: 2 amperes
- ☐ Voltage Breakdown: 750 VRMS @ sea level
- ☐ Cable Retention: 25 pounds min.

PART NO.	NO. OF CONTACTS	CONDUCTORS PER CABLE	DIMENSIONS		
			A	B	C
FIG. 1. CONNECTOR, PLUG					
F5550-171-00	17	17	1½	1½ ₂	1¾
F5550-221-00	22	22	1¾	1½ ₂	2
F5550-271-00	27	27	2	1½ ₂	2¼
F5550-321-00	32	32	2¼	2½ ₂	2½
FIG. 2. CONNECTOR, JACK					
F3550-171-00	17	17	1½	1½ ₂	1¾
F3550-221-00	22	22	1¾	1½ ₂	2
F3550-271-00	27	27	2	1½ ₂	2¼
F3550-321-00	32	32	2¼	2½ ₂	2½
FIG. 3. ADAPTER, FLAT CABLE TO SOLDER CUP					
F2560-341-00	34	17	1½	1½ ₂	1¾
F2560-441-00	44	22	1¾	1½ ₂	2
F2560-541-00	54	27	2	1½ ₂	2¼
F2560-641-00	64	32	2¼	2½ ₂	2½
FIG. 4. CONNECTOR, P/C RECEPTACLE					
F7550-171-00	17	17	1½		1¾
F7550-221-00	22	22	1¾		2
F7550-271-00	27	27	2		2¼
F7550-321-00	32	32	2¼		2½
F7560-341-00	34	17	1½		1¾
F7560-441-00	44	22	1¾		2
F7560-541-00	54	27	2		2¼
F7560-641-00	64	32	2¼		2

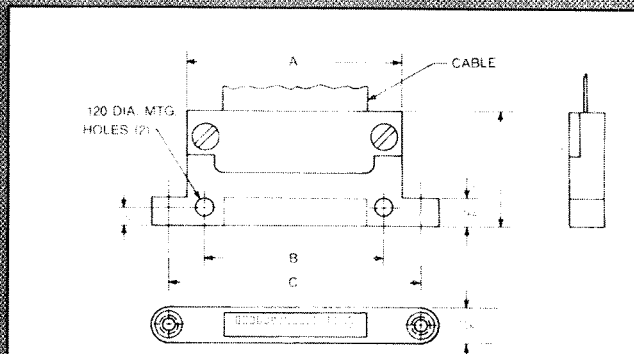


FIG. 1.

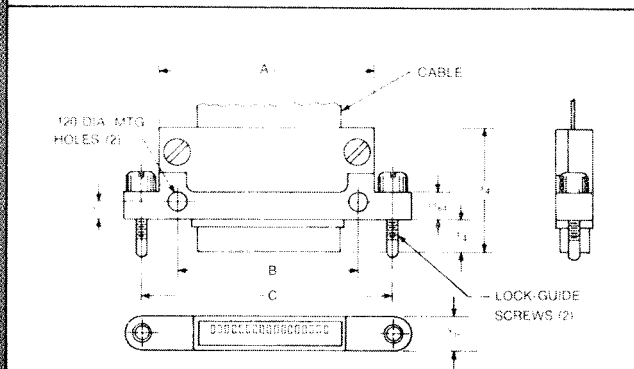


FIG. 2.

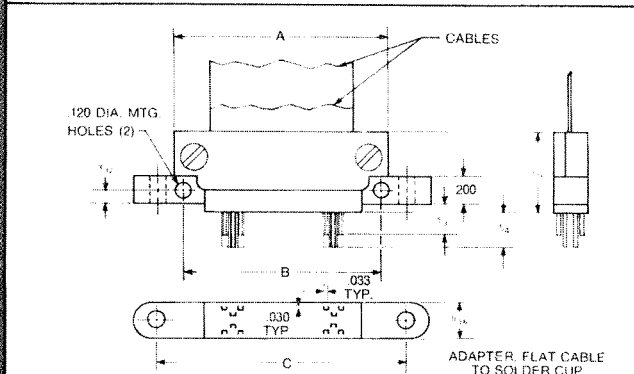


FIG. 3.

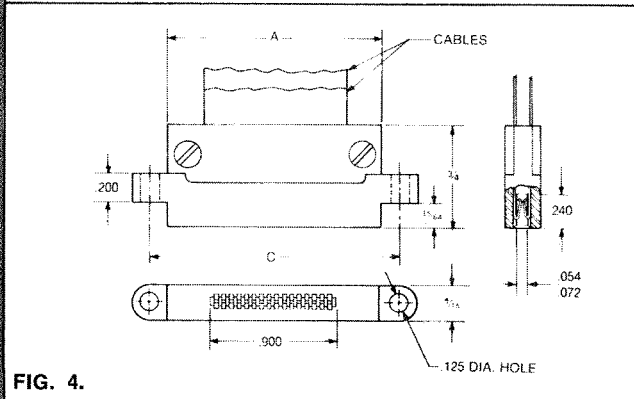


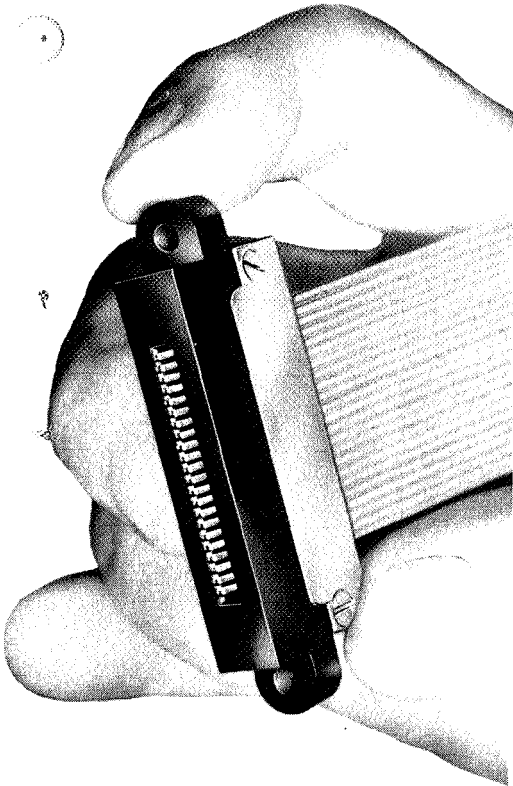
FIG. 4.

Available also for single cable, single sided board, .050 centers or single cable double sided board, .100 centers.

KINGS
ELECTRONICS CO., INC.

40 MARLBOROUGH ROAD | TUCKAHOE, NEW YORK 10707 | (914) SW 3-5000 | TWX 710-562-0110 | TELEX 1-37449

series 50 · mated pair



Series 50 Flat Cable Connector
Kings Electronics Co., Inc.

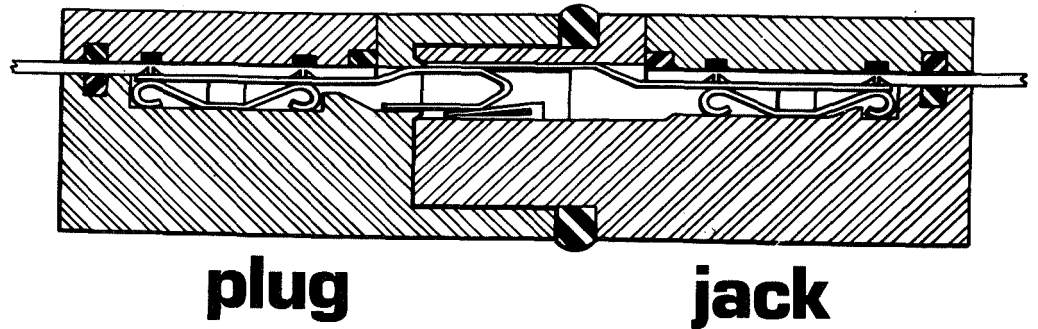


FIGURE 2



KINGS series 50 FLAT CABLE CONNECTORS

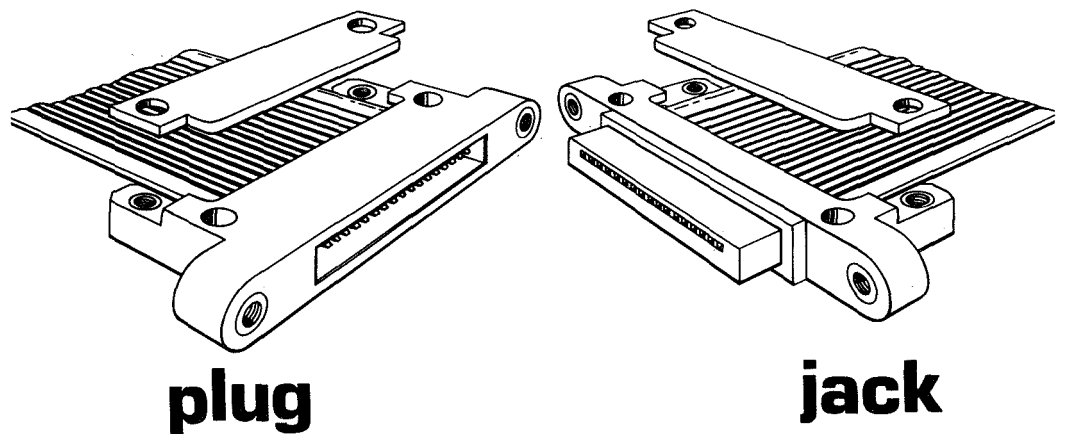


FIGURE 3



9



MALCO



9

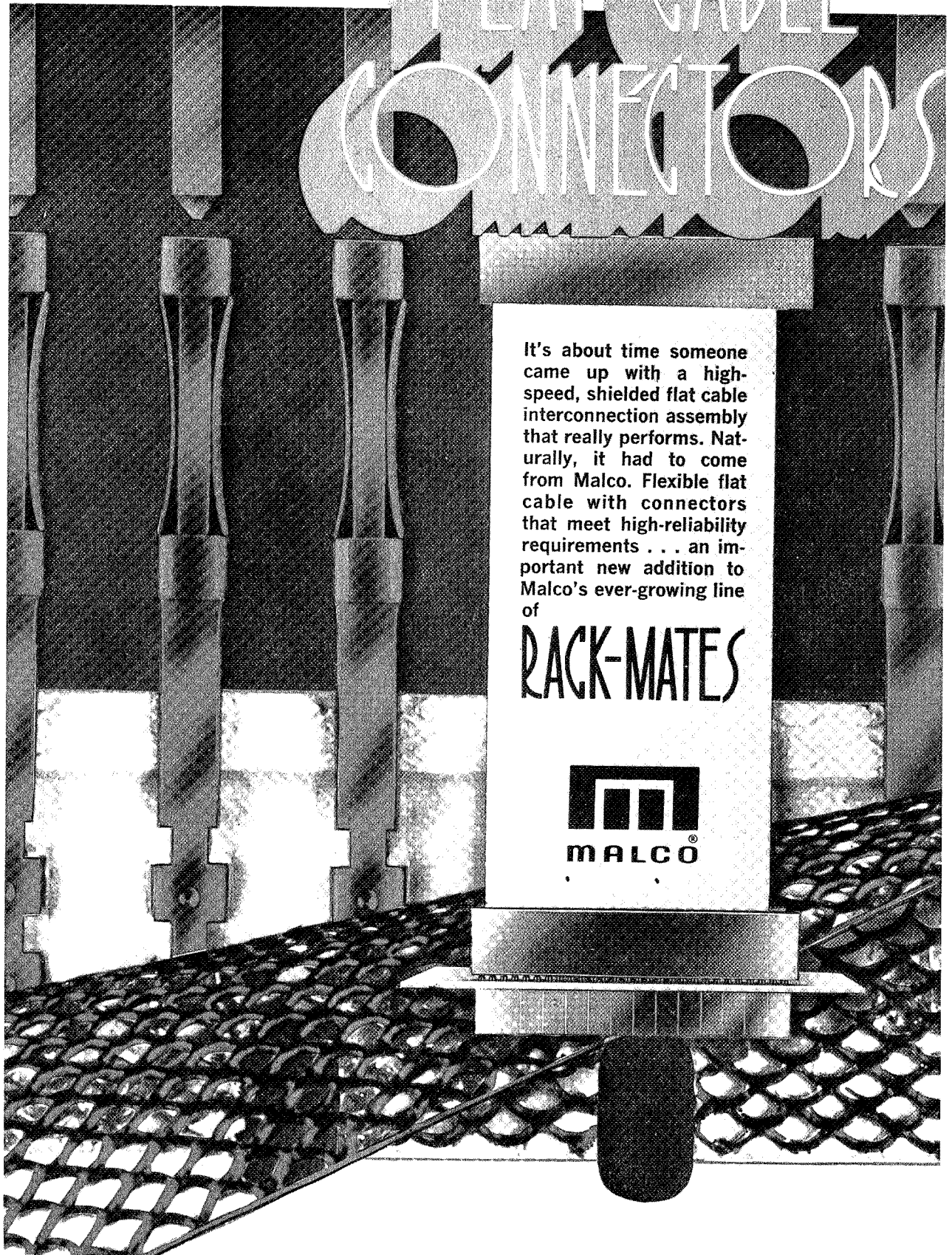
10



FLAT CABLE CONNECTORS

It's about time someone came up with a high-speed, shielded flat cable interconnection assembly that really performs. Naturally, it had to come from Malco. Flexible flat cable with connectors that meet high-reliability requirements . . . an important new addition to Malco's ever-growing line of

RACK-MATES



Flat Cable Has Finally Become Practical...

Malco
innovative engineering
and precision tooling
add a new dimension
to the flexibility
of flat cable.
Malco's newest
Rack-Mate,
FLAT CABLE
features:

Shielding throughout
length of cable
all the way to
the point of connection.

Unique connector
allows mating of
flat cable to any
.025 sq. wrapost tail
on .100, .125 or .150 centers.

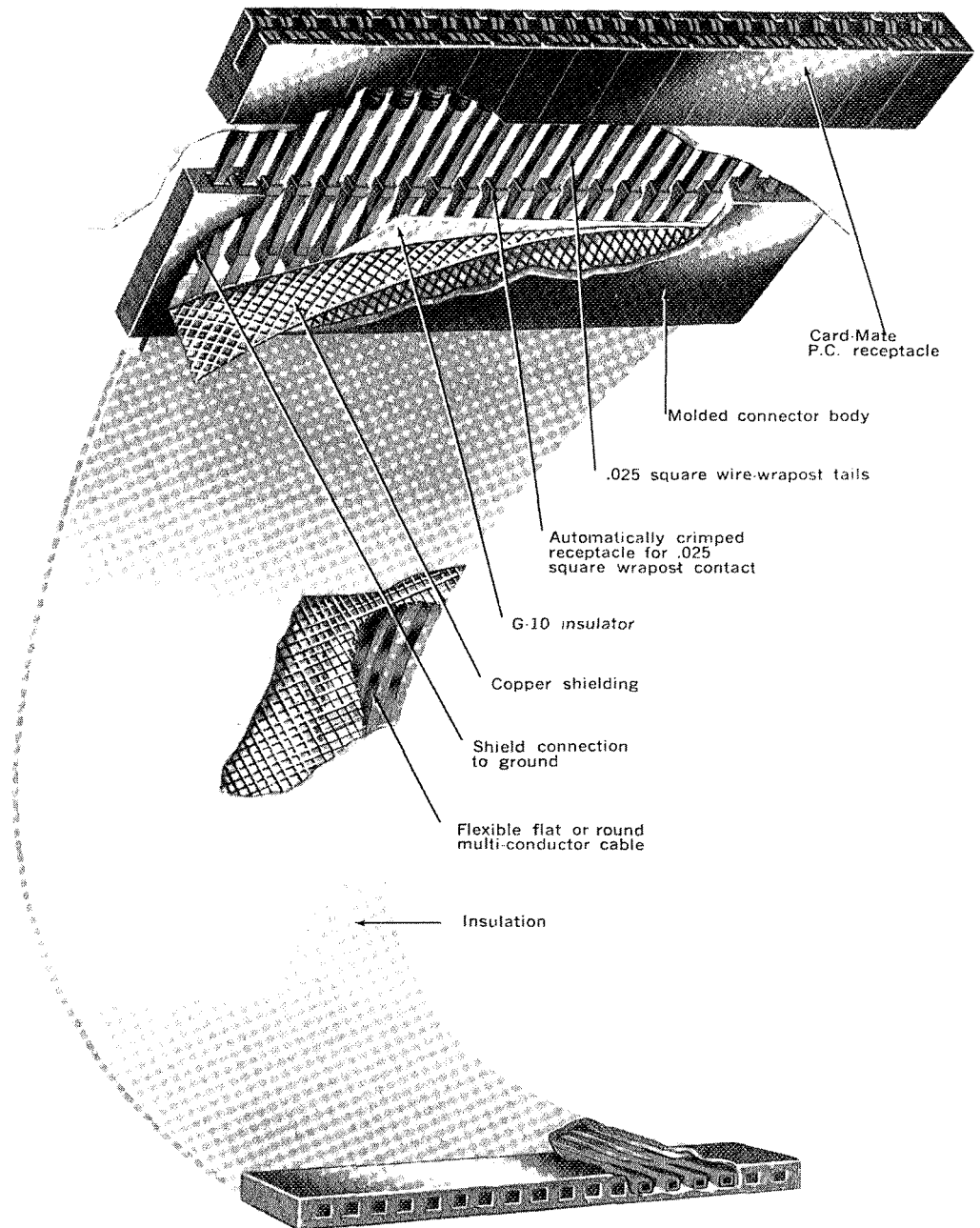
For the first time,
contacts can be automatically
crimped to multi-conductor
round or flat cable--
with consistent reliability.

New molded
connector design
seperates and locks
the crimped contact into place,
insuring a solid
strain relief.

Individual
contact barriers guarantee
outstanding
dielectric properties.

High-quality
4-leaf contacts provide
a consistent, clean wiping
connection to .025 sq. wrapost.

Total resistance
of double connection
(contact to wrapost,
crimp to cable)
is 7 milliohms maximum.



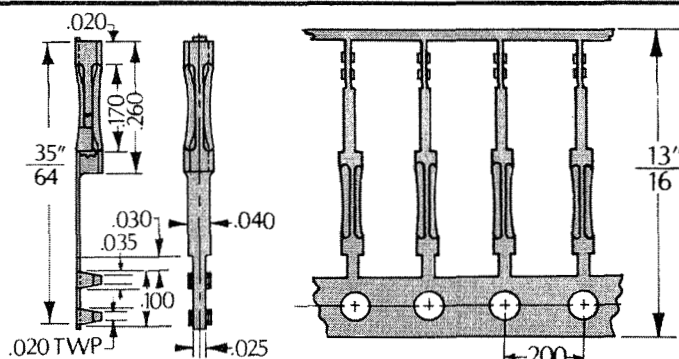
Malco introduces shielded flexible flat cable with reliable, high-speed terminations.

Malco introduces shielded, flexible flat cable jumpers with reliable terminations. Now, through Malco's creative design, flat cable is finally practical, reliable and extremely economical. In addition to saving vital space, Malco's flat cable jumpers offer a considerably higher level of reliability while reducing your overall harness costs.

Although off-the-shelf cable and connectors are available, various cable and connector configurations can be custom designed to your specifications at exceptionally reasonable cost. All connector as-

semblies are designed to meet your precise requirements. You can specify shielded or non-shielded cable, flat or round multi-conductor cable, number and position of precision crimp receptacles, wire gauge and any other variations to fit your design. Malco also offers a wide variety of reliable interconnection and terminating configurations to add even more versatility to your package.

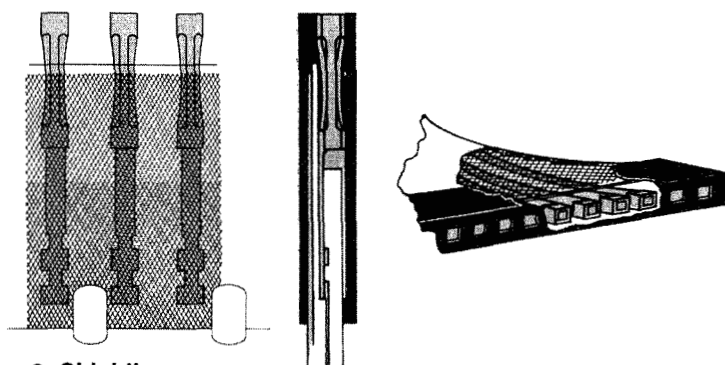
What makes Malco's flat cable connectors practical? Reliability and design simplicity!



1. Automatically Crimped Contacts

Malco's precision, low resistance 4-leaf contacts are automatically crimped to stripped cable in a fraction of the time it takes to strip and terminate conventional cable assemblies. The terminals accept flat or round conductor with equal facility and attach firmly to any .025 square contact. A stop is available in contact area to prevent disruption of 2nd level wire wrap connection.

Because of the positive terminal crimping and receptacle design, Malco's new 4-leaf contact assures *consistently low* resistance connections at both critical connection points. The unique 4-leaf contact is produced from .007 beryllium copper; plating is .000020 gold per MIL-G-45204 over .000050/.000150 nickel per QQ-N-290. Other finishes are also available on request.

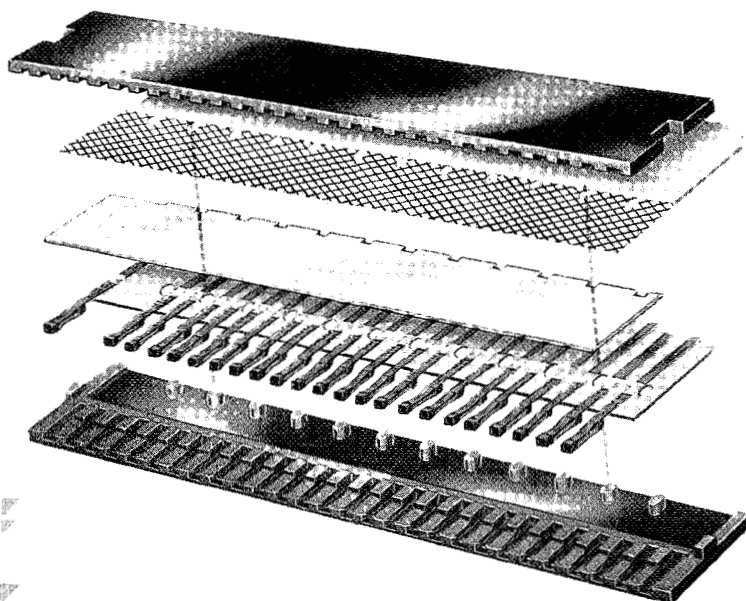


2. Shielding

Another important Malco innovation is the availability of shielding throughout the length of the cable *all the way to the point of connection*. This unique feature makes side-by-side cable stacking possible by reducing crosstalk and interference to a minimum. This Malco feature becomes especially important when you design for high-speed circuits.

3. Unique Connector Assembly

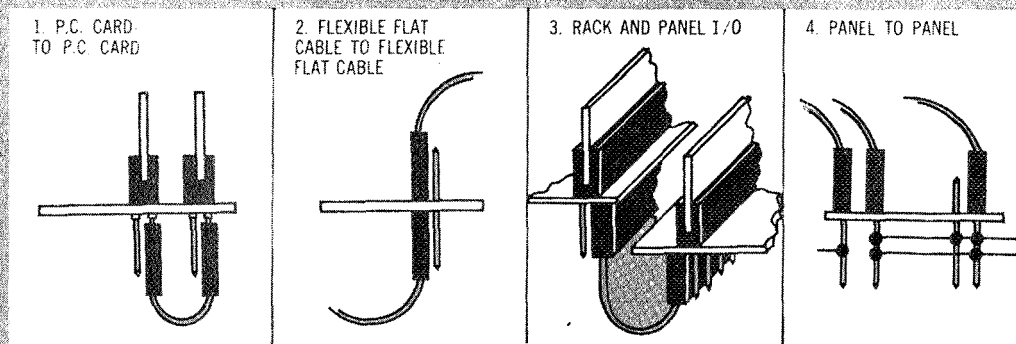
Malco's new molded connector housing holds contacts and cable firmly in place and then is ultrasonically welded together to form a rigid connector. Slots in the housing hold and separate each terminal. In addition, prepositioned strain relief holes in the cable affix the connector to the cable for added rigidity and strength. With the addition of the connector assembly, the crimped terminals become a solid connector for I/O cable, cable-to-cable, card-to-card and panel-to-panel functions. By controlling all materials, finishes, components, tooling and processes, Malco can positively assure the highest degree of reliability at a minimum cost for your flat cable inter-connection configurations.



FLEXIBLE FLAT CABLE

MALCO PUTS FLEXIBILITY IN FLEXIBLE FLAT CABLE

New, automatically crimped contacts, shielding, molded body assembly and an infinite variety of wires and conductors make Malco's flat cable the most useful and practical cable available. But that's only the beginning. Add to these advanced characteristics a wide variety of interconnection and terminating configurations...and you have a total flat cable package.



FLAT CABLE INTERCONNECTION CHARACTERISTICS

Mechanical

1. Insertion of 4-leaf contact:
10 oz. maximum individual per .025 square wrapost
2. Retention of 4-leaf contact
2 oz. min. individual
3 oz. min. average
3. Contact: .007 beryllium copper
4. Connector Housing: Noryl SE 1
5. Plating: As required
6. Cable Insulation: PVC or Teflon

Electrical

1. Contact current rating: 3 Amps
2. Contact Resistance:
Total of crimp and wrapost connection:
7 milliohms max. plus cable length resistance
3. Dielectric Withstanding Voltage:
500 VDC min. at sea level
4. Insulation Resistance
5000 megohms min. at 500 VDC

Important Notice: For design details and additional information about Malco Flat Cable Connectors and other Rack-Mates, please write us on your letterhead specifying intended application.

We solve your mating problems.



MALCO

MALCO MANUFACTURING COMPANY INC

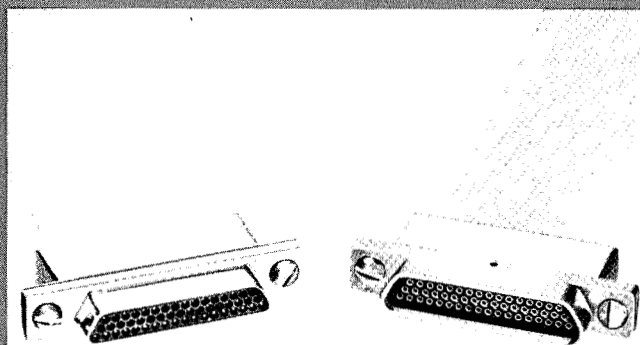
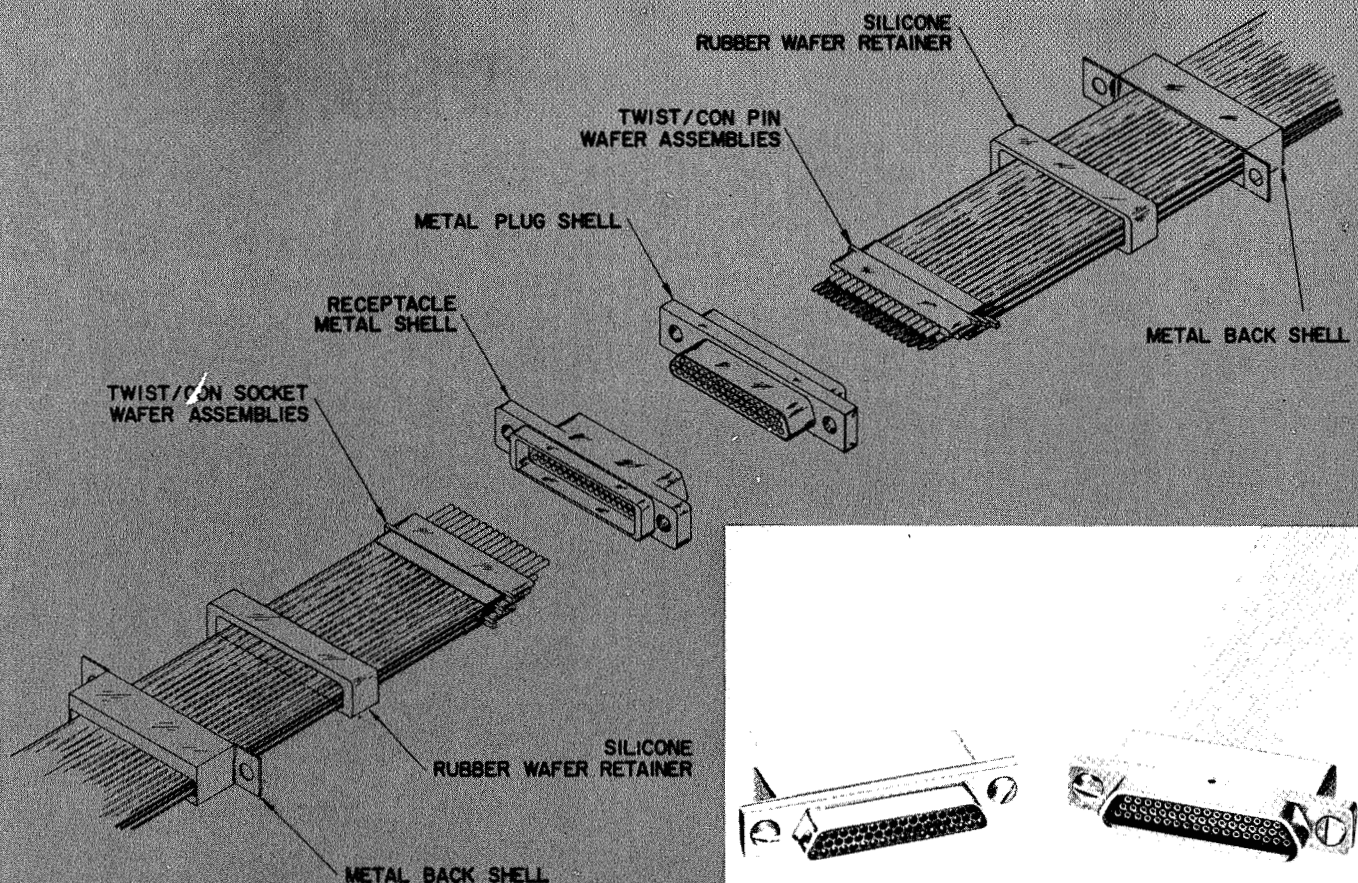
5150 WEST ROOSEVELT ROAD
CHICAGO, ILLINOIS 60650
(312) 287-6700

MICRODOT





"FLEXMATE" Connector Series Metal Shell Flat Conductor Cable Connector



ACTUAL SIZE

With the new Flat Conductor Cable Connector, you can completely terminate and circuit check a cable *before* the finished assembly is inserted into the metal housing. Never again will you detect a wiring error after the connector is fully assembled.

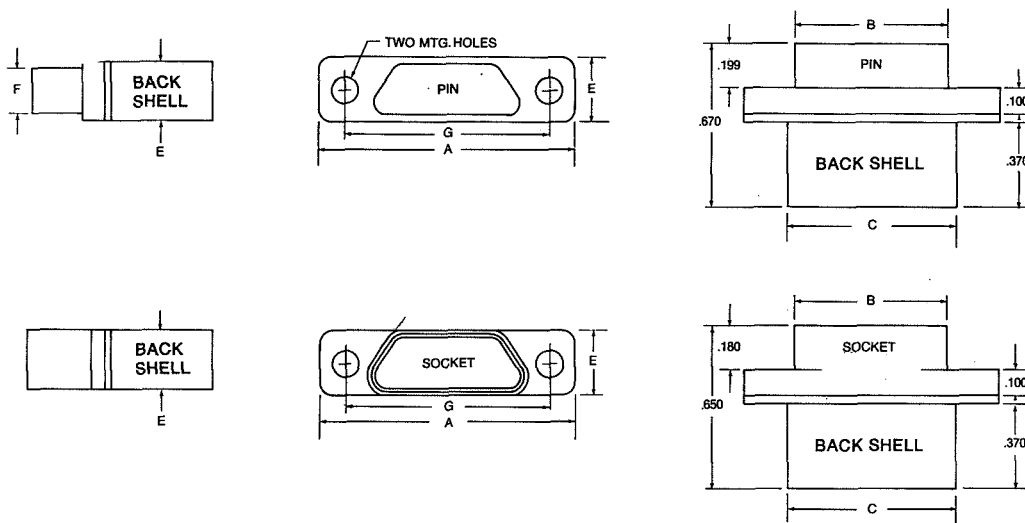
This new line from Microdot is intermountable and intermateable with all plastic and metal types in the MICRO/CON line. The new types also utilize the proven TWIST/CON configuration. The connectors accommodate cable built to MIL-C-55543, in widths of $\frac{1}{4}$ ", $\frac{1}{2}$ ", and 1" — and any commercial cable of various widths with 0.050" centers. Units are available with pin layouts as few as 9 and as many as 51.

The connector utilizes a housing identical to that of the Microdot Metal Shell MICRO/CON D. The flat conductor cable is welded or soldered to a plastic module which is plugged into the back of the connector. A back shell, mechanically attached to the front of the connector, holds the modules in place.

For use in harsh environments, the connectors can be supplied with interfacial sealing — and if additional sealing is required, can be potted.

Without potting, the Microdot Inc. Flat Conductor Cable Connector is a field repairable unit, rear insertable, and rear removable. The only available unit on 0.050" centers that is!

Metal Shell Flat Conductor Cable Connector



Inches								Avg. Weight (oz.) $\pm 5\%$
Type Number See Note	A $\pm .005$	B $\pm .005$	C $\pm .005$	D $\pm .005$	E $\pm .005$	F $\pm .005$	G $\pm .005$	
MCD**-9P***	.780	.290	.412	.370	.208	.135	.565	.026
-9S	.780	.365	.412	.370	.208	—	.565	.025
-15P	.930	.440	.562	.370	.208	.135	.715	.038
-15S	.930	.515	.562	.370	.208	—	.715	.035
-21P	1.080	.590	.712	.370	.208	.135	.865	.053
-21S	1.080	.665	.712	.370	.208	—	.865	.050
-25P	1.180	.690	.812	.370	.208	.135	.965	.063
-25S	1.180	.765	.812	.370	.208	—	.965	.056
-31P	1.330	.840	.962	.370	.208	.135	1.115	.080
-31S	1.330	.915	.962	.370	.208	—	1.115	.073
-37P	1.480	.990	1.112	.370	.208	.135	1.270	.086
-37S	1.480	1.065	1.112	.370	.208	—	1.270	.076
-51P	1.430	.940	1.014	.370	.250	.178	1.215	.109
-51S	1.430	1.015	1.014	.370	.250	—	1.215	.093

Back Shell Mounting Hardware



#2 — 56 St. Steel
Length



#2 — 56 Lockwasher
St. Steel



$\frac{1}{32}$ Hex St. Steel

098-0001-000X

Dimensions subject to change.

Nomenclature for Flat Conductor Cable Connectors

MCD M2 37 P F 1 18.0

Lead length in inches XX.X

Method of termination

- 1 — Full complement welded.
- 2 — Full complement soldered.

Flat Conductor Cable Type

- F — Wafers without cable termination
- C — PVC insulated FCC
- K — Kapton insulated
- M — Mylar insulated

- P — Polyethylene insulated
- T — Teflon insulated
- X — Special custom cables

Contact Type

- P — Pin
- S — Socket

Layout

- 9, 15, 21, 25, 31, 37, 51

Shell Type and Material

- M2 — Metal Shell
- Screw Mount
- Diallyl Phthalate Inserts
- (FCCC Hardware)

Connector Series

Technical and Performance Data

Performance:

CONTACT RESISTANCE

The average mated contact resistance is 4 milliohms, with a maximum value of 8 milliohms, using standard #24 solid copper leads when measured directly behind the crimp joints of the mated pin and socket contacts. The average resistance value at 100 microvolts is 4.8 milliohms.

DIELECTRIC WITHSTANDING VOLTAGE

(60 Hz rms rooms temperature)

Sea Level 1000

70,000 feet 300

VIBRATION

(Per Mil-Std-202C, method

204-A, condition D)

No discontinuity in excess of 1 microsecond during twelve 20 minutes sweeps from 10 to 2,000 CPS at .06 double amplitude or 20 G forces, whichever is less.

CORROSION RESISTANCE

(Per Mil-Std-202C, method

101B, condition B)

Both mated and unmated samples do not exceed the maximum allowable contact resistance (8 milliohms) when subjected to the 48 hour salt spray test.

DURABILITY

The contact resistance after 2,000 mating cycles is less than the maximum allowable, 8 milliohms.

INSULATION RESISTANCE

Greater than 5,000 megohms at room temperature for the materials listed under MATERIALS.

MAXIMUM CURRENT CARRYING

CAPACITY

No. 24 contact 3 amperes

It must be recognized, however, that all the wires to a connector will not carry their maximum current under all environmental conditions due to wire temperature.

CONTACT ENGAGING AND

SEPARATION FORCES

6 oz. maximum

0.5 oz. minimum

TEMPERATURE RANGE

(Operating)

Diallyl phthalate -65°F to +300°F

Materials:

INSULATOR

Diallyl phthalate per MIL-M-14, Type SDG-F

CONTACTS

Pin contact — Copper alloy (Alloys of beryllium copper and brass make up the complete construction.)

Socket Contact — Copper alloy

BODY SHELLS

Pin Body Shell, stainless steel, Types 304

Cond. A per QQ-S-766

Socket Body Shell, aluminum alloy per QQ-A-591, A-380 Alloy

FLAT CONDUCTOR CABLE BACK SHELLS

Same as Pin Body Shell above.

Finishes:

INSULATOR

None

CONTACTS

Standard finish is 0.000050 gold over copper flash per Mil-G-45204, Type II

BODY SHELLS

Pin Body Shell, passivated per Mil-F-14072 (E-300)

Socket Body Shell, electroless nickel per Mil-C-26074, Class 1, except thickness is .001/.0015

Note: Insulators are molded into their metal shells — No bonded joint is used.

FLAT CONDUCTOR CABLE BACK SHELLS

Same as Pin Body Shell above.

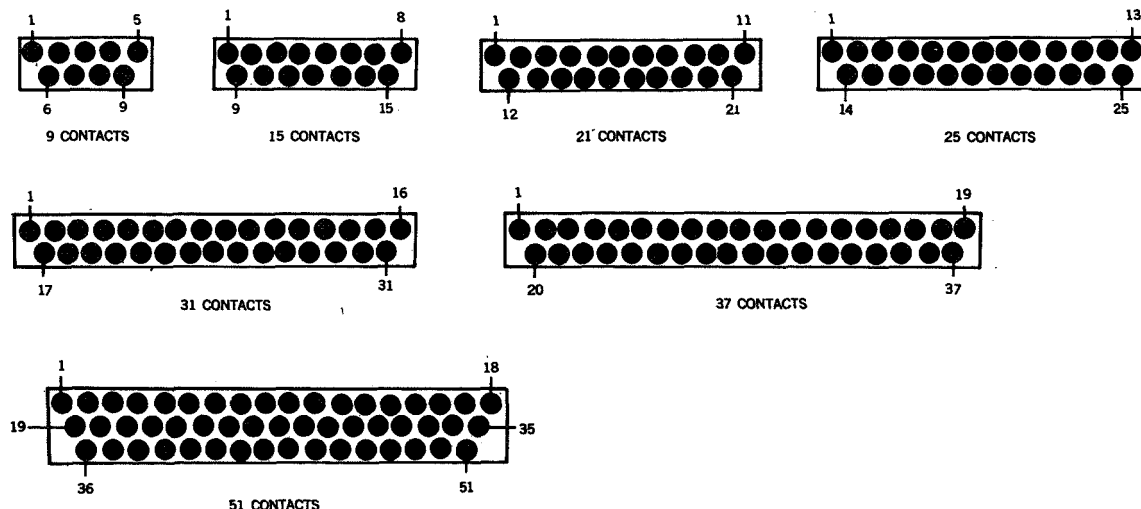
FLAT CONDUCTOR CABLE ACCOMMODATION

Up to 19 conductors on .050" spacing. Total complement of Micro/Con line can be used.

WAFER

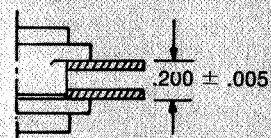
Diallyl

Contact arrangement as viewed from the engaging face of the pin side

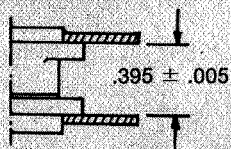


Panel mounting and panel cutout dimensions

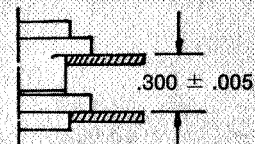
Panel Mounting Dimensions



Plug and receptacle
rear mounted

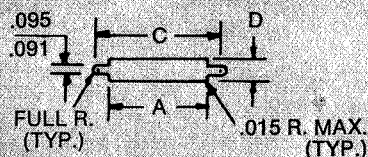


Plug and receptacle
front mounted



Plug front mounted
Receptacle rear mounted

Panel Cutout Dimensions



Screw mount front or rear

PANEL CUTOUT DIMENSIONS			
Shell Size	A +.004 -.000	C min.	D +.004 -.000
MCDM-9	.452	.570	.217
MCDM-15	.602	.720	.217
MCDM-21	.752	.870	.217
MCDM-25	.852	.970	.217
MCDM-31	1.002	1.120	.217
MCDM-37	1.152	1.270	.217
MCDM-51	1.102	1.220	.217
MCDM-51	1.102	1.220	.259

Dimensions subject to change.



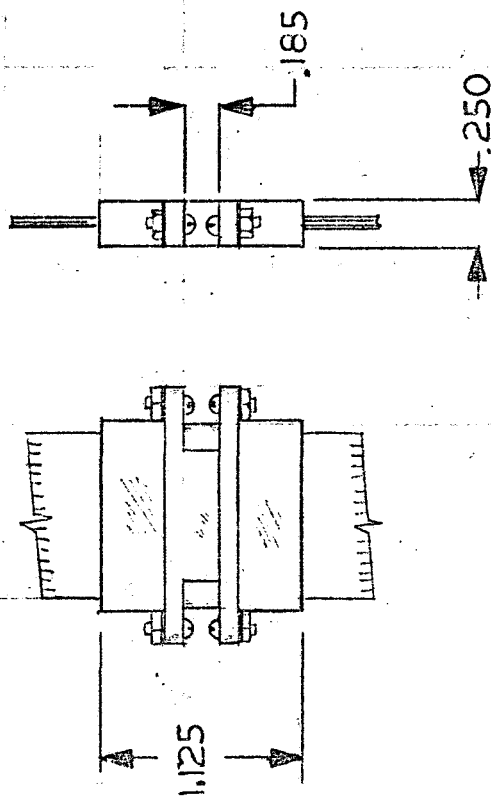
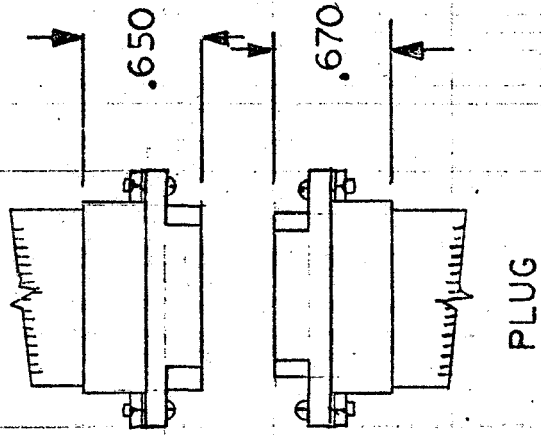
MICRODOT INC.

220 Pasadena Avenue, South Pasadena, California 91030 ■ (213) 682-3351

CONNECTOR DIVISION

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C 252-5102-0001
D



MICRODOT INC.
SOUTH PASADENA, CALIF.

STANDARD TOLERANCES
UNLESS OTHERWISE SPECIFIED
DEC. \pm .005
ANGLES \pm .005
ECCENTRICITY
HOLE DIA. \pm .005
SURFACE ROUGHNESS
MICRO INCHES
THREADS TO MIL-S-7742
COMMERCIAL TOLERANCES
APPLY TO STOCK DIMENSIONS

SURFACE TREATMENT

MATERIAL
REF. 4 P.I.B. 7-1

APP
APP
CHECKED BY
DRAWN BY

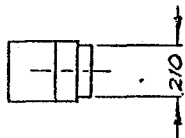
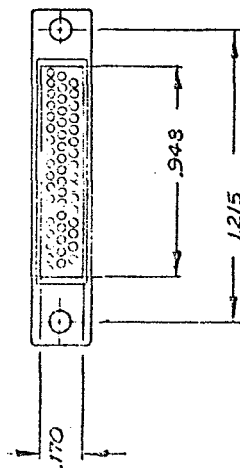
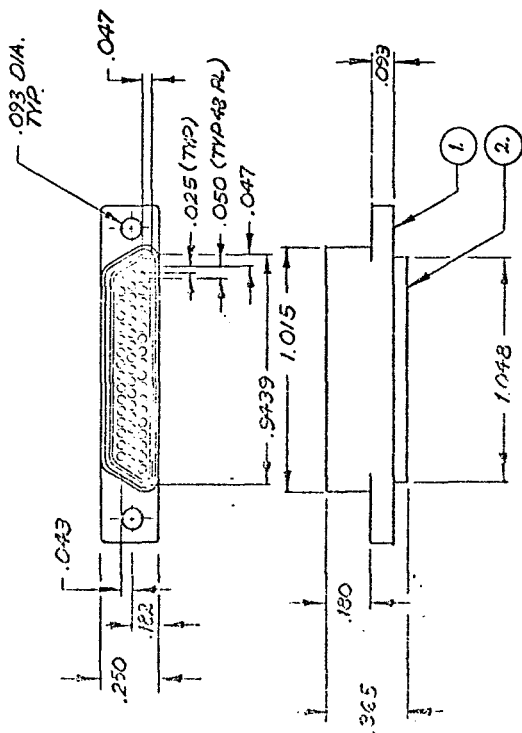
SCALE
IX
WT
DATE
3-24-70

DRAWING NUMBER
C 252-5102-0001
D

MATED AND UNMATED ASS'Y.
DETAILS
MCDM2 - SERIES 51 P/R

ASSEMBLY	NO	REC'D	BY	DATE	APP
NEXT ASSEMBLIES	A	11021	REL'D	RD	3-24-70
REVISION DESCRIPTION	LET	ECO	BY	DATE	APP

REVISIONS			
SYN	DESCRIPTION	DATE	APPROVED
1	RELEASED	08-2-51	277

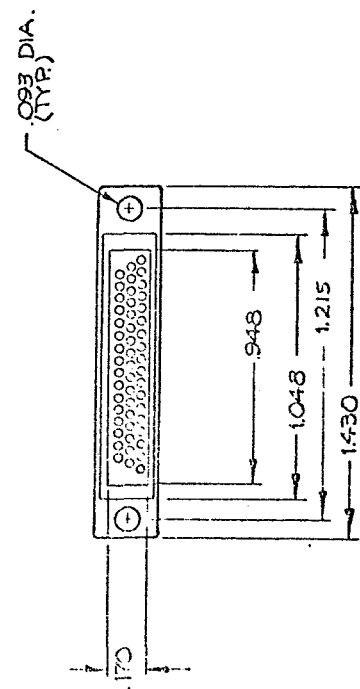
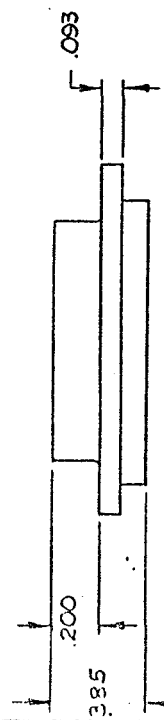
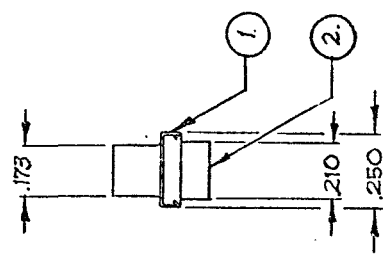
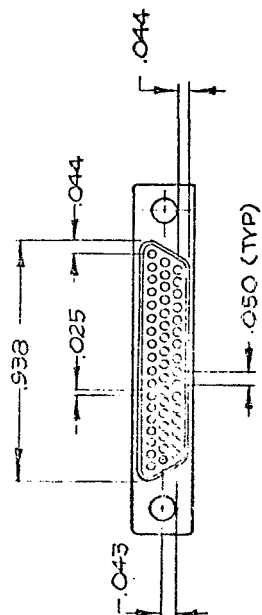


AR	INSULATOR	DIALYL PHTHALATE PER MIL-M-14F	2.
1	HOUSING	ALUMINUM ALLOY, NICKEL PLATED	1
QTY REQD	PART NO.	MATERIAL & SPECIFICATION	ITEM NO.
LIST OF MATERIAL OR PARTS LIST			
DRAWN: <i>[Signature]</i> <i>[Signature]</i> <i>[Signature]</i> CHECK: <i>[Signature]</i> <i>[Signature]</i> <i>[Signature]</i> PR. ENG: <i>[Signature]</i> <i>[Signature]</i> <i>[Signature]</i> CH. ENG: <i>[Signature]</i> <i>[Signature]</i> <i>[Signature]</i> MATERIAL: <i>[Signature]</i> <i>[Signature]</i> <i>[Signature]</i>			
DIMENSIONS ARE IN INCHES TOLERANCES DECIMALS FRACTIONS .XX ± .XX .XXX ± .XXX ANGLES ±			
SURFACE TREATMENT			
SURFACE ROUGHNESS			
DO NOT SCALE THIS DWG			
TOP ASSY.			
SIZE B		CODE IDENT. NO. 98278	CD
SCALE		WT	SHEET 1 OF 1

MICRODOT INC.
 220 PASADENA AVE. SO. PASADENA, CALIF.
INSULATOR HOUSING
 SUB-ASSEMBLY
 HQ001-5151

SIZE B
 CODE IDENT. NO. 98278
 CD
 097-0036-5100

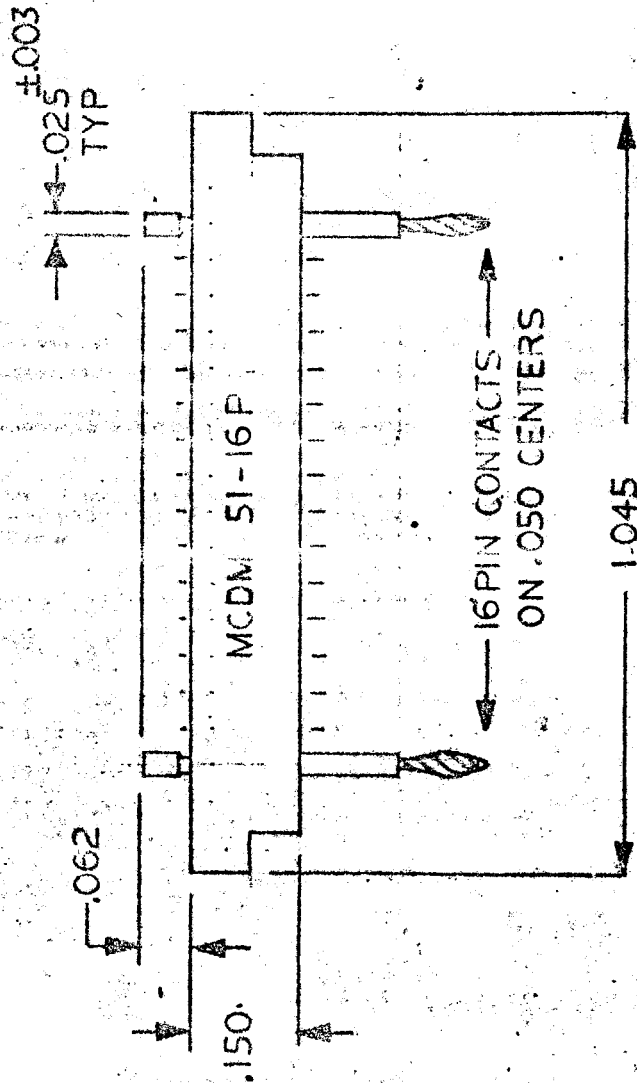
REVISIONS		
SYM	DESCRIPTION	DATE APPROVED
1	RELEASED	0622 2306 7 817



AR	INSULATOR	DIALYL PHTHALATE PER MIL-M-14F TYPE SDG-F.	2.
1	HOUSING	STAINLESS STEEL, 304	1.
QTY REQ.	PART NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.
LIST OF MATERIAL OR PARTS LIST			
UNLESS OTHERWISE SPECIFIED			
DIMENSIONS ARE IN INCHES			
TOLERANCES			
DECIMALS FRACTIONS			
XXX ± .001			
XXX ± .002			
XXX ± .005			
ANGLES ±			
SURFACE TREATMENT			
DO NOT SCALE THIS DWG			
TOP ASSY.	SURFACE ROUGHNESS		
SCALE			
WT			
SHEET / OF /			
SIZE CODE IDENT.			
B NO. 98278 CD 097-0085-5100			
INSULATOR HOUSING SUB - ASSEMBLY MICROMI-5101			
MICRODOT INC. 220 PASADENA AVE. S.O. PASADENA, CALIF			
DRAWN 15.4.71			
CHECK J. A.			
PR. ENG. J. A.			
CHK. ENG. J. A.			
MATERIAL			

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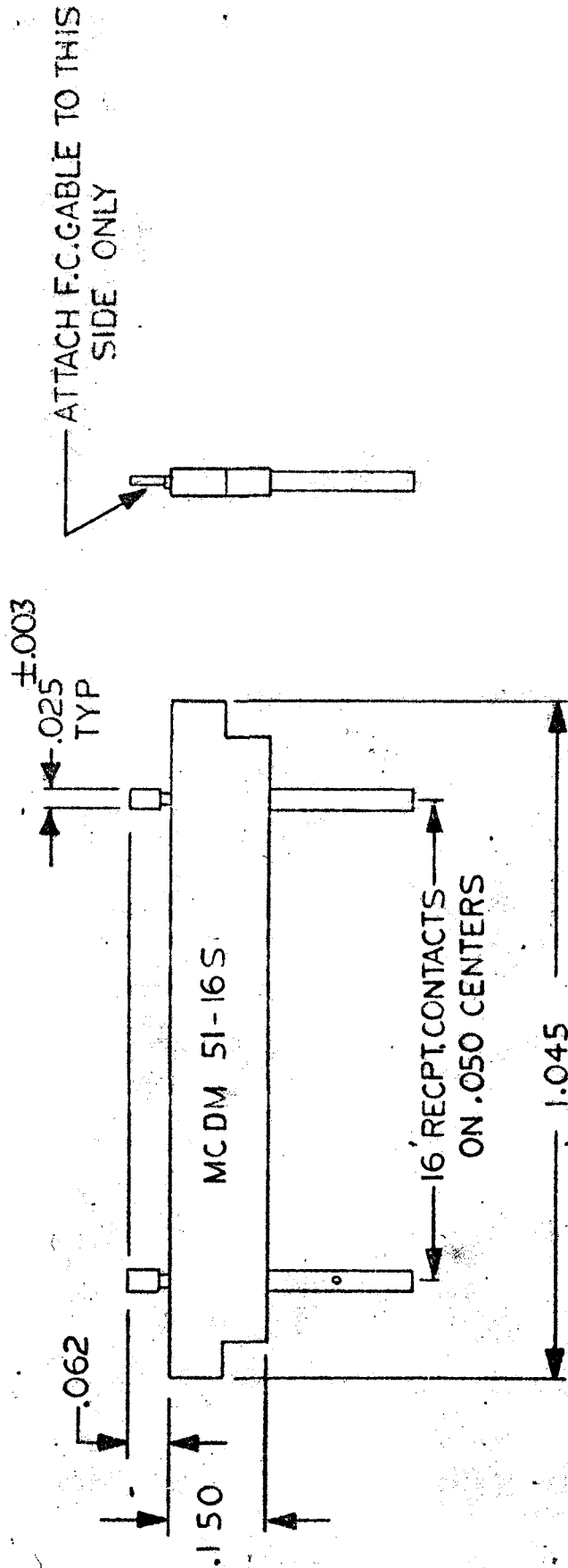
250-4201-0001 A



Microdot Inc. SOUTH PASADENA, CALIF.		SURFACE TREATMENT GOLD PLATED	
STANDARD TOLERANCES UNLESS OTHERWISE SPECIFIED DIM. \pm .010 ANGLES \pm .010 HOLE DIA. \pm .010 SURFACE ROUGHNESS MICRO INCHES TYPICAL TO MIL-S-7142 CO. TOLERANCES APPLY TO STOCK DIMENSIONS		MATERIAL INSUL-DIALYL CONT. COPPER ALLOY	
WAIVER CONTACT ASSY. FCCC MCDM 51-16P		CHECKED BY DATE SCALE 4 X	
ASSEMBLY NO. 1101 LET ECO		DRAWING NUMBER 250-4201-0001	
REVISION DESCRIPTION Rev'd		DATE 2/1/70	

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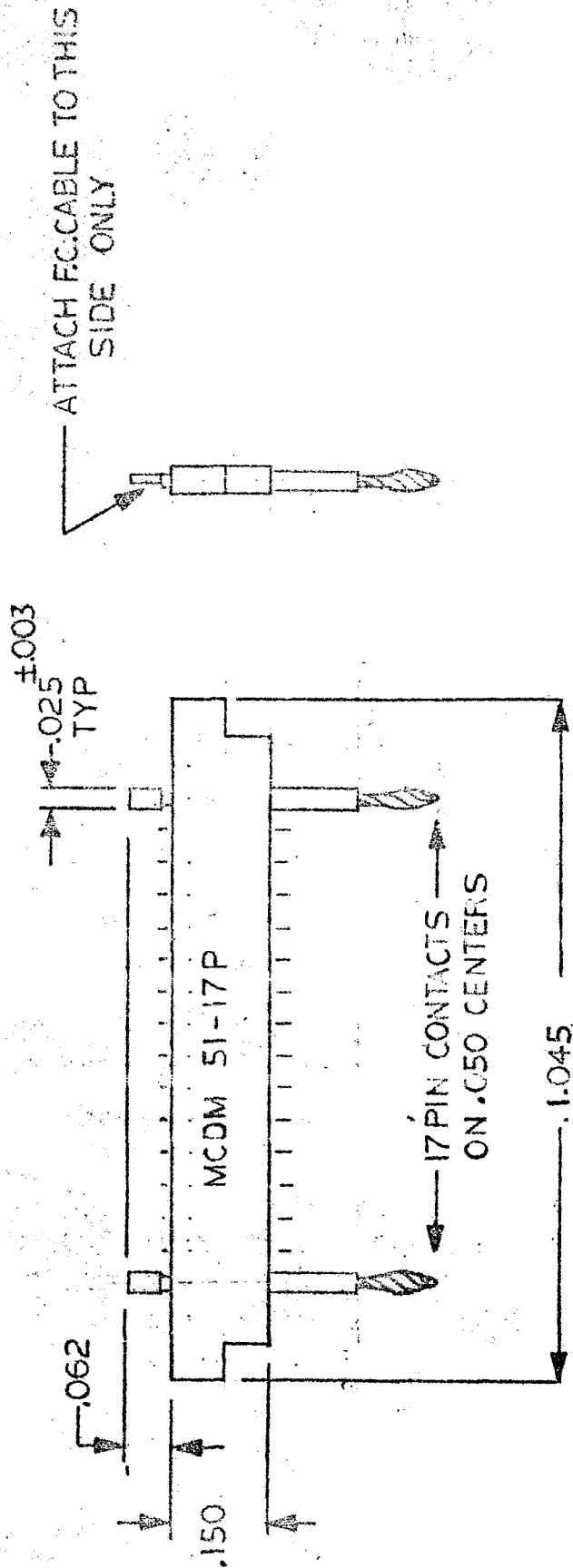
C 250-4202-0001 A
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Microdot INC. SOUTH PASADENA, CALIF.		SURFACE TREATMENT		GOLD PLATED	
		MATERIAL		INSUL. DIALYL CONT. COPPER ALLOY	
STANDARD TOLERANCES UNLESS OTHERWISE SPECIFIED DEC. ± .010 FRACTION ± ANGLES ± ECCENTRICITY MAX. T.I.R. HOLE DIA. + SURFACE ROUGHNESS		MICRO INCHES THREADS TO MIL-S-7742 COMMERCIAL TOLERANCES APPLY TO STOCK DIMENSIONS		APP APP <i>Ron Roberts</i> CHECKED BY DRAWN BY <i>R.E.</i>	
WAIVER CONTACT ASSB'Y. FCCC. MCDM 51-16S		SCALE		DATE	
		4 X		22070	
		DRAWING NUMBER		C 250-4202-0001 A	
ASSEMBLY NEXT ASSEMBLIES		LET ECO A 11021		REV'D BY DATE APP	
		REVISION DESCRIPTION			

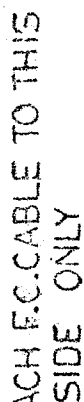
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250-4201-0002 A



MICRODOT INC. 2001 PASADENA, CALIF.		GOLD PLATED	
STANDARD TOLERANCES UNLESS OTHERWISE SPECIFIED DEC. 25 1970		SURFACE TREATMENT INSUL. DIALLYL CONT. COPPER ALLOY	
FIN. CO. # ANODIZING EX. TEMP. HO. TEMP. SURFACE FINISH		MATERIAL INSUL. DIALLYL CONT. COPPER ALLOY	
WAIVER CONTACT ASSY. FC. C.		MCDM 51-17P	
DATE 12-1-70		BY 250-4201-0002	

250-4202-0002 A



WAFER CONTACT ASS'Y. FCCC.
MCDM 51-17S

250-4201-0003 A

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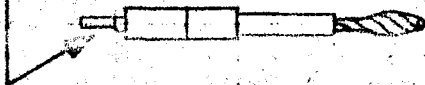
0.062

MCDM 51-18 P

18PIN CONTACTS
ON .050. CENTERS

1.045

ATTACH FC.CABLE TO THIS
SIDE ONLY



MICRODOT INC.
SOUTH PASADENA, CALIF.

SURFACE TREATMENT GOLD PLATED

MATERIAL
INSUL. DIALLYL
CONT. COPPER ALLOY

APP

APP

CHECKED BY

DRAWN BY

SCALE

4 X

WT

DATE

2/9/70

DRAWING NUMBER

250 4201 0003

STANDARD TOLERANCE
UNLESS OTHERWISE SPECIFIED
DEC. ± .010
FRACTIONS ± .010
ANGLES ± .010
HOLE DIA. ± .010
HOLE DIA. ± .010
SURFACE ROUGHNESS
THREDS TO MIL-DTL-883C
COMMERCIAL TOLERANCES
APPLY TO STOCK AND FINISHING

WAFER CONTACT ASSY. FCC

MCDM 51-18 P

BY DATE APP

REVISION DESCRIPTION

LET ECO

REL'D

250 4201 0003

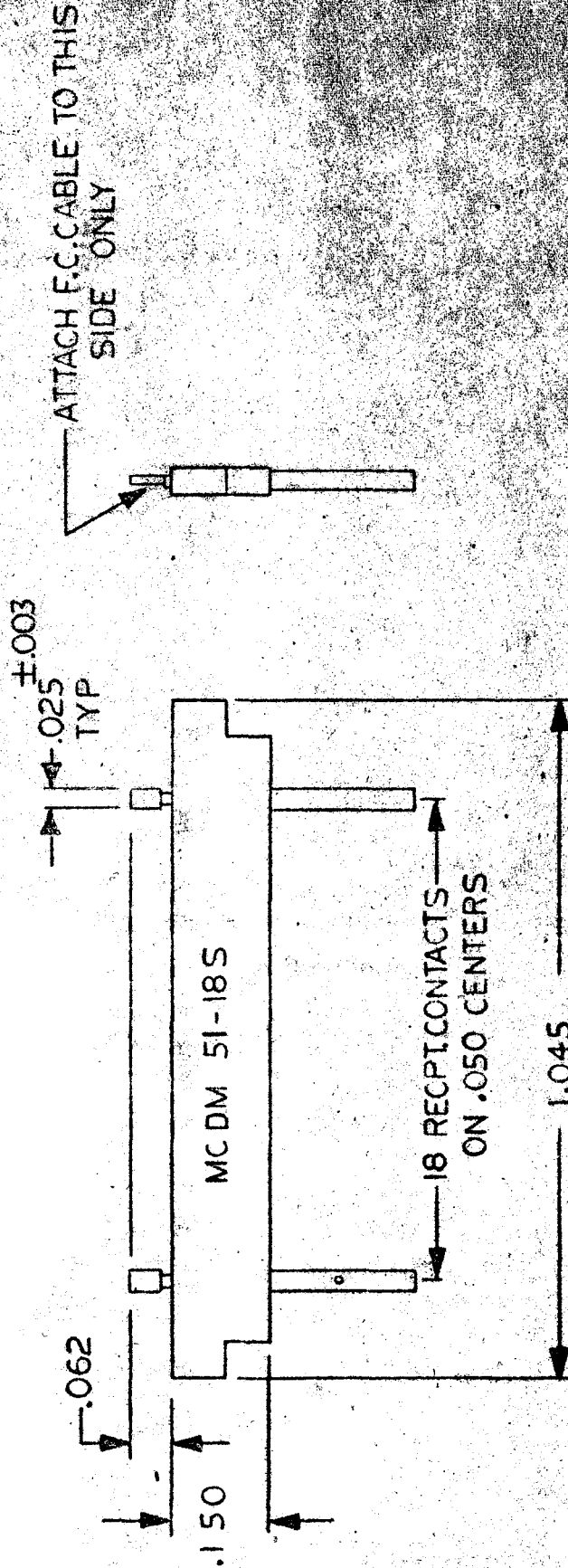
250 4201 0003

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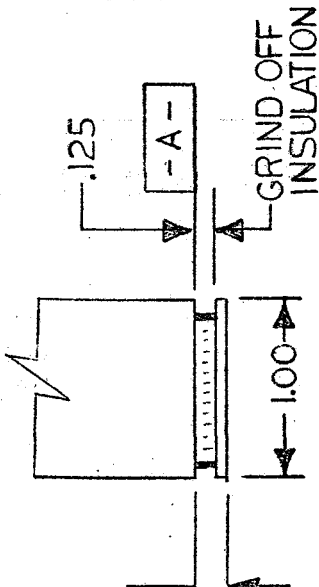


MICRODOT INC. SOUTH PASADENA, CALIF.		SURFACE TREATMENT: GOLD PLATED	
STANDARD TOLERANCES UNLESS OTHERWISE SPECIFIED DEC. ± .010 ANGLES ± ECCENTRICITY MAX. T.I.R. HOLE DIA. ± SURFACE ROUGHNESS MICRO INCHES THREADS TO MILS-7742 COMMERCIAL TOLERANCES APPLY TO STOCK DIMENSIONS		MATERIAL: DIALYL INSUL. CONT. COPPER ALLOY	
WAFFER CONTACT ASSBY. FCCG.		MCDM 51-18S	
ASSEMBLY NO. REQ'D NEXT ASSEMBLIES	A 11021 LET EGO	REV'D REVISION DESCRIPTION	DATE APP
SCALE: 4 X DATE: 12/20/70 DRAWING NUMBER: 250-4202-0003		DRAWING BY:	

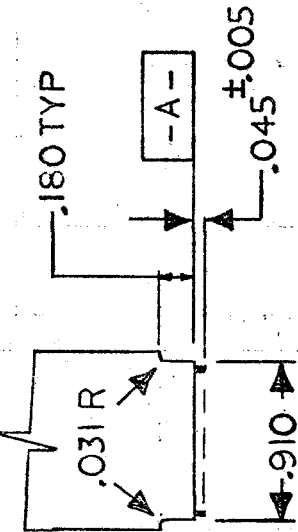
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TC-ASMB-1

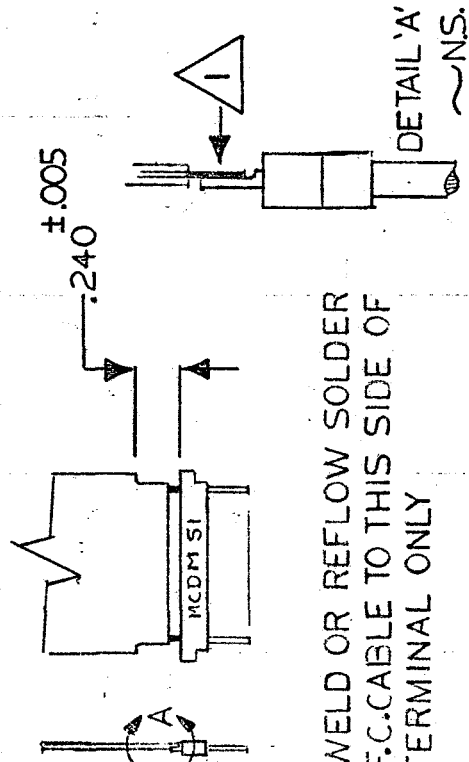
OP #1



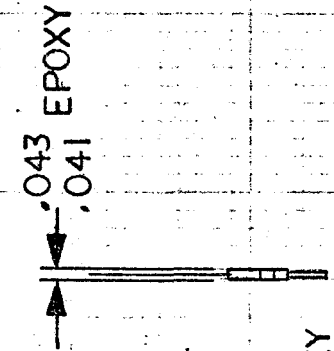
SOLDER DIP IF APPLICABLE



OP #3



OP #4



WELD OR REFLOW SOLDER F.C. CABLE TO THIS SIDE OF TERMINAL ONLY

MICRODOT INC.
SOUTH PASADENA, CALIF.

STANDARD TOLERANCES
UNLESS OTHERWISE SPECIFIED
DEC. \pm .005
FRACTION \pm .005
ANGLES \pm
ECCENTRICITY
MAX. T.I.R. .010
HOLE DIA. +
SURFACE ROUGHNESS
MICRO INCHES
THREADS TO MIL-S-7742
COMMERCIAL TOLERANCES
APPLY TO STOCK DIMENSIONS

SURFACE TREATMENT

MATERIAL

APP

APP

CHECKED BY

DRAWN BY

SCALE

WT

DATE

ASSEMBLY
NO
REQ'D

NEXT ASSEMBLIES

LET

ECO

REVISION DESCRIPTION

BY CK

DATE

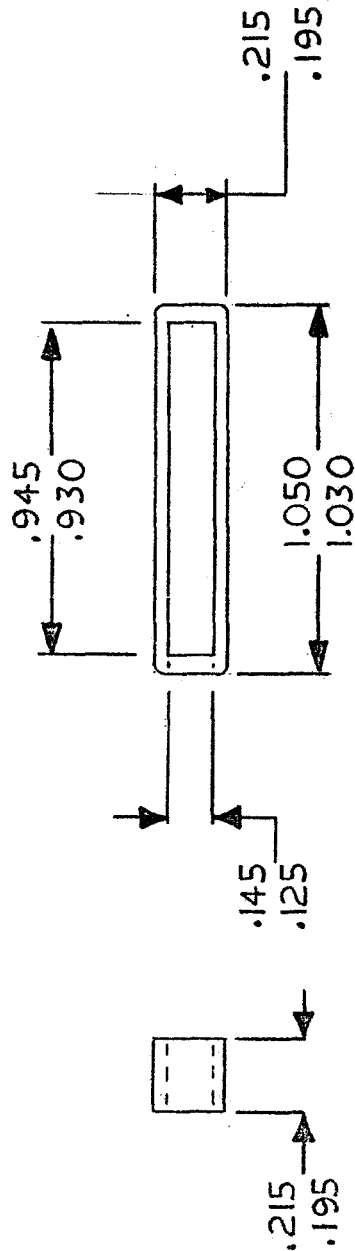
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TRIM AND TERMINATION DETAILS
FOR MCDM2-51 P/S CONNECTORS

DRAWING NUMBER
TC-ASMB-1

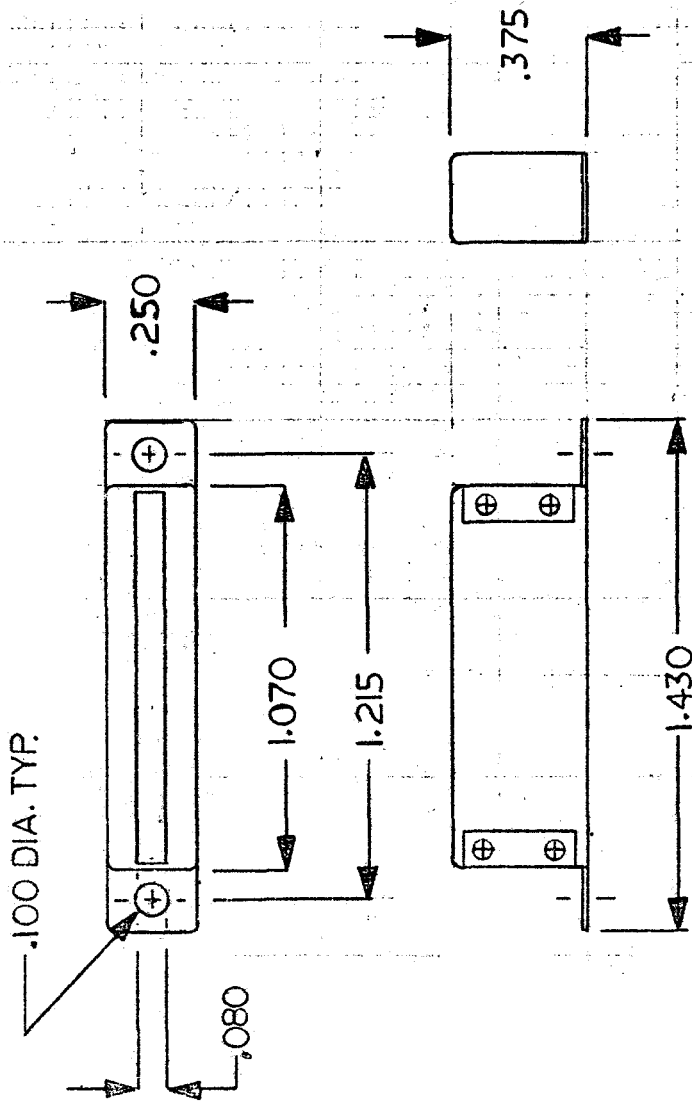
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C/D 000-1402-0000 A



MICRODOT INC. SOUTH PASADENA, CALIF.		SURFACE TREATMENT	
STANDARD TOLERANCES UNLESS OTHERWISE SPECIFIED DEC. ± FRAC. ± ANGLES ± ECCENTRICITY MAX. T.I.R. HOLE DIA. + SURFACE ROUGHNESS		MICRO INCHES THREADS TO MIL-S-7742 COMMERCIAL TOLERANCES APPLY TO STOCK DIMENSIONS	
MATERIAL SILICONE RUBBER		APP R. Roberts CHECKED BY DRAWN BY R.D.	
SCALE 2 X		WT .34 GM	
DATE 2-17-70		DRAWING NUMBER C/D 000-1402-0000	
PLUG, INSERT, WAFER RETAINER FCCC, MCDM 51P/R			
ASSEMBLY	NO REQ'D	LET	ECO
REVISION	DESCRIPTION	BY	DATE
1	REL'D	R.D.	2-20-70
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000-1702-0009

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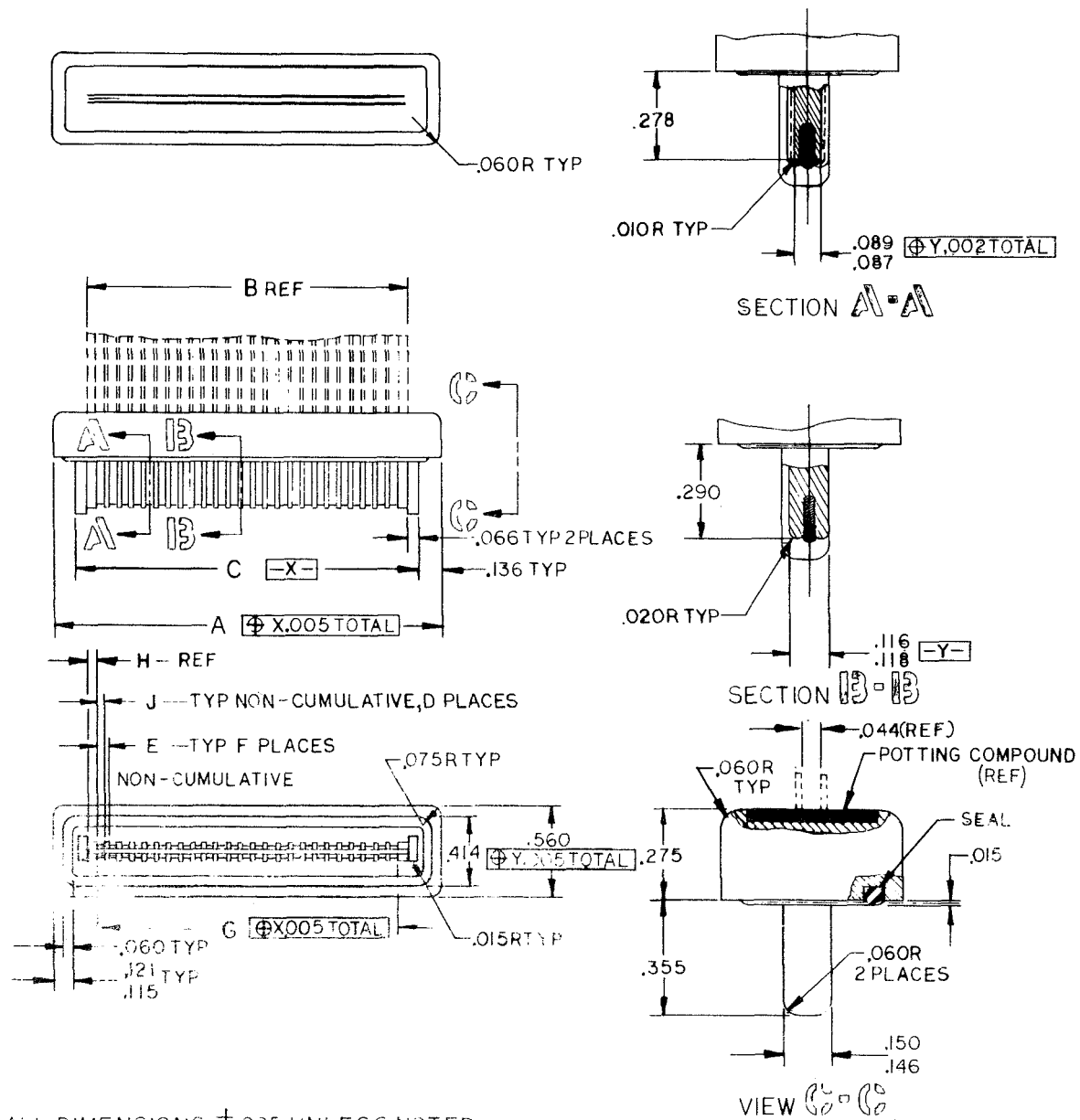
MICRODOT INC. SOUTH PASADENA, CALIF.		SURFACE TREATMENT		PASSIVATED	
		MATERIAL		STAINLESS STEEL #305	
STANDARD TOLERANCES UNLESS OTHERWISE SPECIFIED		DEC. ±		.010	
ANGLES ±		ECCENTRICITY		HOLE DIA. ±	
MAX. T.I.R.		SURFACE ROUGHNESS		MICRO INCHES	
THREADS TO MIL-S-7742		COMMERCIAL TOLERANCES		APPLY TO STOCK DIMENSIONS	
BACKSHELL - MCDM2-51 P/S		SCALE		2X	
DATE		WT		1.1 GM	
22370		CHECKED BY		R D	
DRAWN BY		R D		D	
D		C		D	
DRAWING NUMBER		000-1702-0009		A	
ASSEMBLY	NO REQ'D	A	1101	REL'D	REVISION DESCRIPTION
NEXT ASSEMBLIES	LET ECO				

NASA



MILITARY SPECIFICATION SHEET
CONNECTORS, ELECTRICAL, ENVIRONMENT RESISTANT
FOR USE WITH FLEXIBLE FLAT CONDUCTOR CABLE AND ROUND WIRE
PLUG, CABLE CONDUCTOR, PREMOLDED (FLAT CABLE)

THE COMPLETE REQUIREMENTS FOR PROCURING THE CONNECTOR DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN EFFECT OF SPECIFICATION MIL-C-55544



ALL DIMENSIONS $\pm .005$ UNLESS NOTED

FSC 5935

MIL-C-55544/5

CONTACT IDENTIFICATION

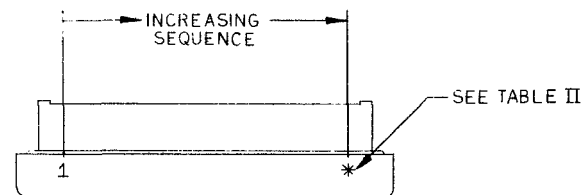
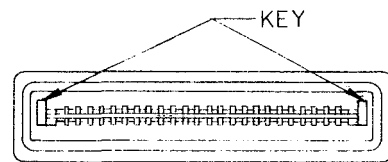
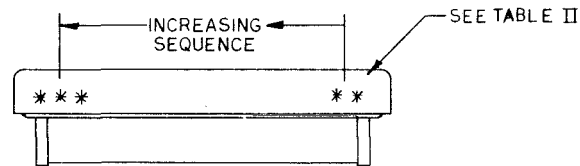
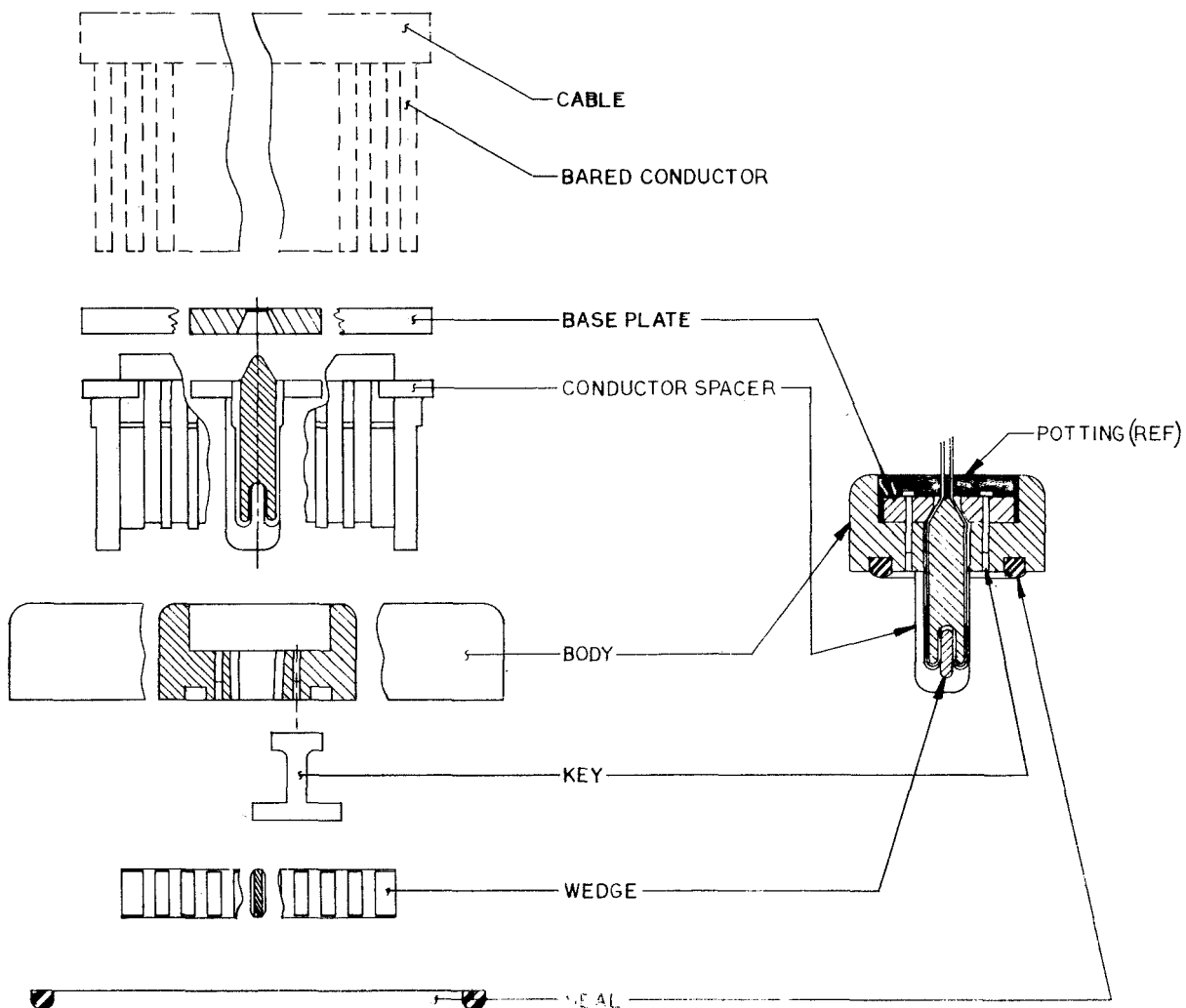


TABLE II
CONTACT IDENTIFICATION

CABLE WIDTH	BASIC SPACING	NOM SIZE	*	**	***	CABLE WIDTH	BASIC SPACING	NOM SIZE	*	**	***	CABLE WIDTH	BASIC SPACING	NOM SIZE	*	**	***
C	2	1	17	18	34	C	3	1	12	13	24	C	4	1	9	10	18
D	2	1 1/2	27	28	54	D	3	1 1/2	18	19	36	D	4	1 1/2	14	15	28
E	2	2	37	38	74	E	3	2	25	26	50	E	4	2	19	20	38
F	2	2 1/2	47	48	94	F	3	2 1/2	32	33	64	F	4	2 1/2	24	25	48
G	2	3	57	58	114	G	3	3	38	39	76	G	4	3	29	30	58

MIL-C-55544/5



THE M55544/5 PLUG PARTS SHOWN ARE REQUIRED FOR THE COMPLETED PLUG ASSEMBLY. THE COMPLETE PART NUMBER IS SHOWN ON TABLE 1 ON PAGE 2 AND CONSISTS OF THE FOLLOWING:

BASE PLATE	- GLASS FILLED EPOXY	QTY - 1
CONDUCTOR SPACER	- GLASS FILLED EPOXY	QTY - 1
BODY	- GLASS FILLED EPOXY	QTY - 1
WEDGE	- GLASS FILLED EPOXY	QTY - 1
SEAL	- SILICONE RUBBER	QTY - 1
KEY	- BRASS, 1/2 HARD	QTY - AS REQUIRED

THE CABLE IS NOT PART OF THIS SPECIFICATION BUT IS TO BE CALLED OUT AS REQUIRED ON THE USING DRAWING. THE POTTING MATERIAL WILL ALSO BE CALLED OUT AS REQUIRED ON THE USING DRAWING. THE CABLE SHALL BE PREPARED AND THE ABOVE LISTED PARTS SHALL BE ASSEMBLED PER DRAWING MS 73078 "METHOD DRAWING M55544/5 PLUG ASSEMBLY, FLAT CONDUCTOR CABLE."



ALL DIMENSIONS $\pm .005$ UNLESS NOTED

MIL-C-55544/6

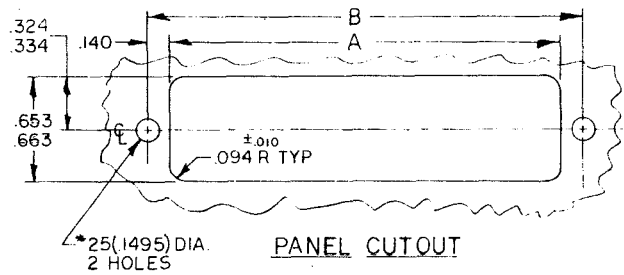
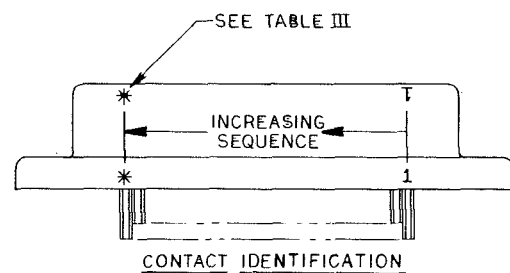
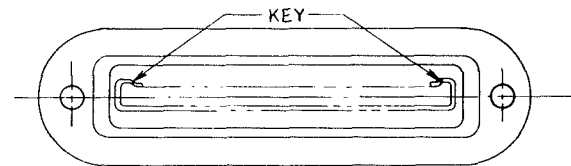
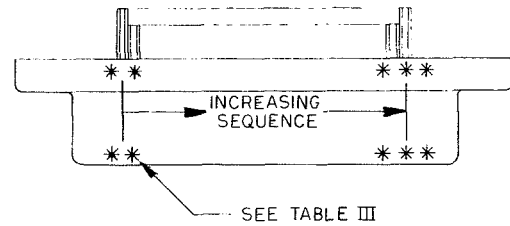


TABLE II
PANEL CUTOUT

MILITARY PART NO.	NOM. SIZE	DIM. A ±.005	DIM. B ±.005
M55544/6 S*C	1	1 510	1 790
M55544/6 S*D	1 1/2	1 960	2 240
M55544/6 S*E	2	2 485	2 765
M55544/6 S*F	2 1/2	3 010	3 290
M55544/6 S*G	3	3 460	3 740

TABLE III
CONTACT IDENTIFICATION

CABLE WIDTH	BASIC SPACING	NOM. SIZE	*	**	***
C	2	1	17	18	34
D	2	1 1/2	27	28	54
E	2	2	37	38	74
F	2	2 1/2	47	48	94
G	2	3	57	58	114
C	3	1	12	13	24
D	3	1 1/2	18	19	36
E	3	2	25	26	50
F	3	2 1/2	32	33	64
G	3	3	38	39	76

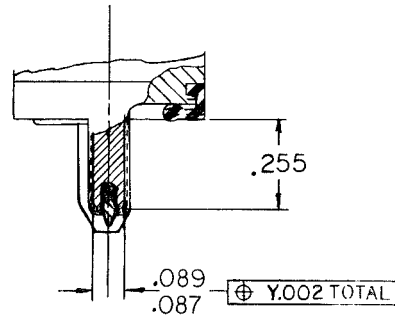
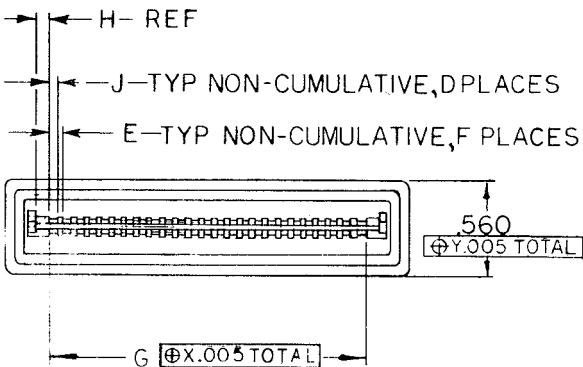
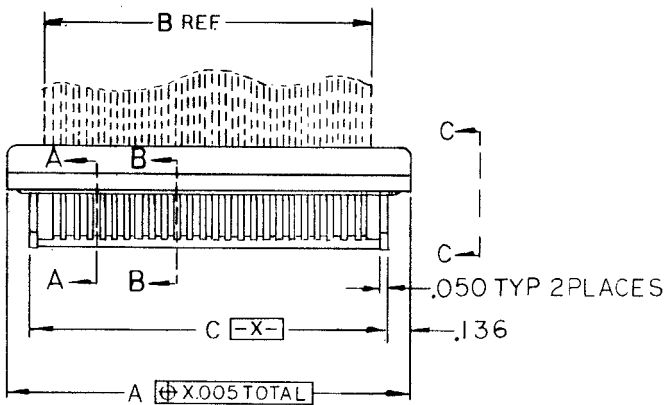
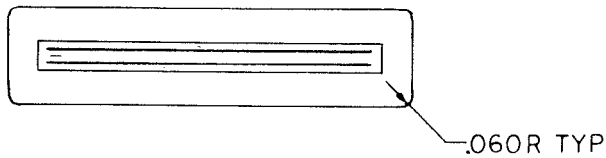


CABLE WIDTH	BASIC SPACING	NOM. SIZE	*	**	***
C	4	1	9	10	18
D	4	1 1/2	14	15	28
E	4	2	19	20	38
F	4	2 1/2	24	25	48
G	4	3	29	30	58

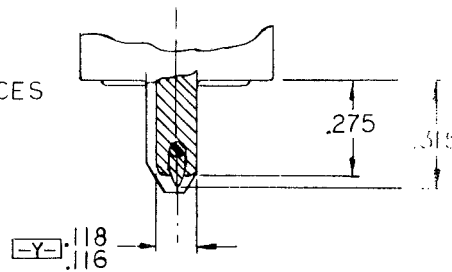
NASA-MSFC PLUG NUMBER 50M72604 (Page 1 of 3)

MILITARY SPECIFICATION SHEET
 CONNECTORS, ELECTRICAL ENVIRONMENT RESISTANT
 FOR USE WITH FLEXIBLE FLAT CONDUCTOR CABLE AND ROUND WIRE
 PLUG, CABLE CONDUCTOR, MOLDED ON (FLAT CABLE)
 THE COMPLETE REQUIREMENTS FOR PROCURING THE CONNECTOR DESCRIBED HEREIN
 SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN EFFECT OF SPECIFICATION MIL-C-55544

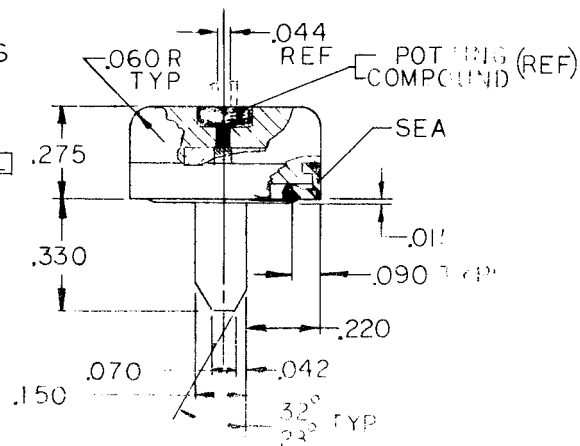
MIL-C-55544/7
 26 December 1968



SECTION A-A



SECTION B-B



VIEW B-B

FSC 5935

ALL DIMENSIONS $\pm .005$ UNLESS NOTED

MIL-C-55544/7

CONTACT IDENTIFICATION

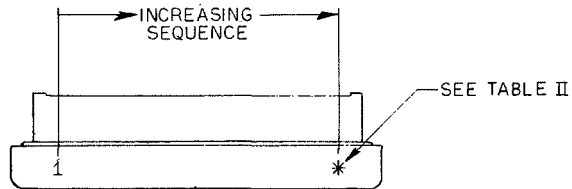
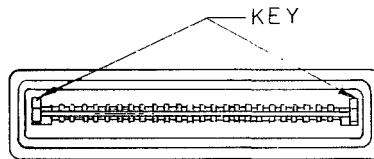
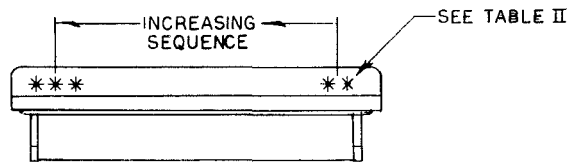
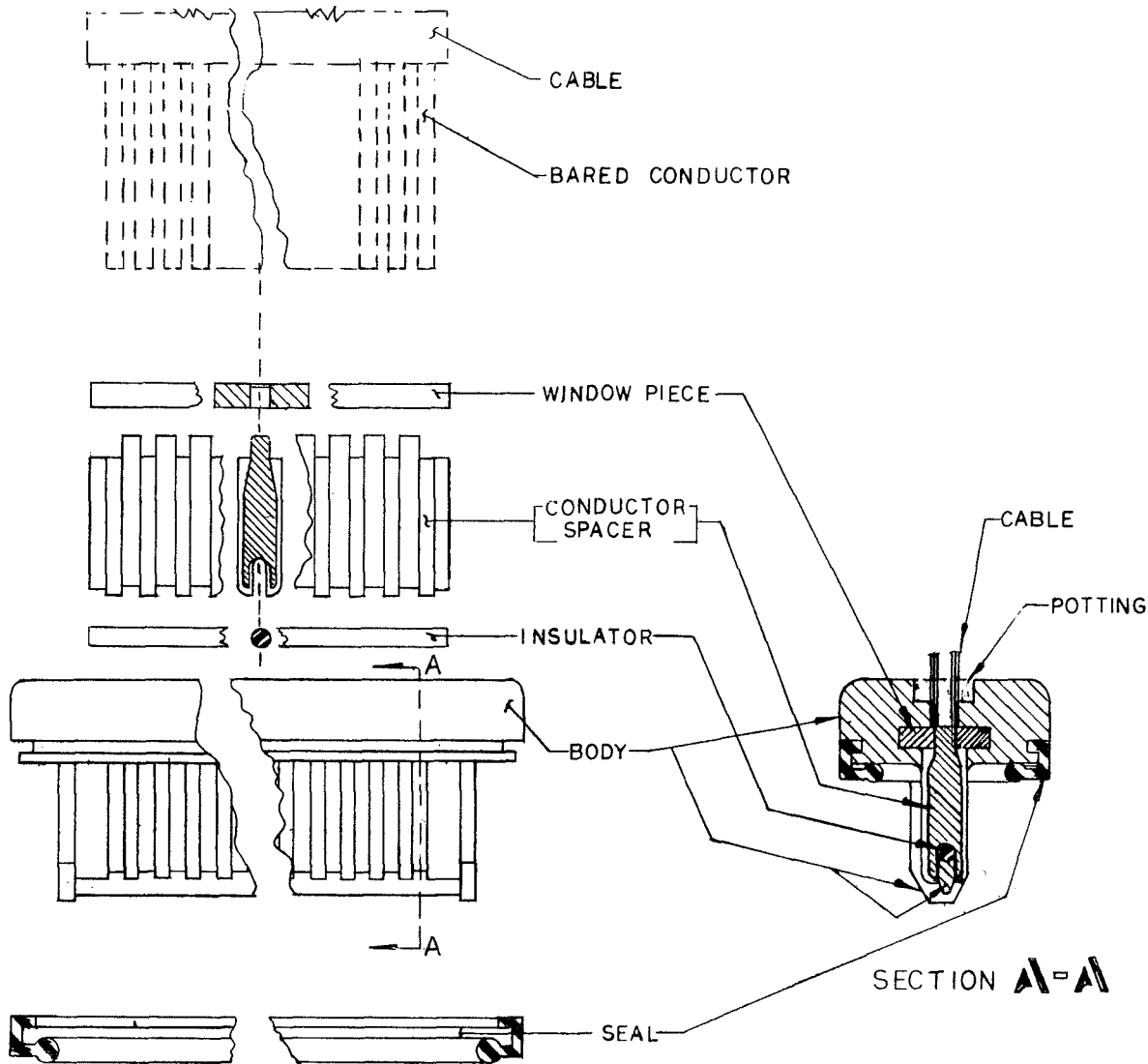


TABLE II
CONTACT IDENTIFICATION

CABLE WIDTH	BASIC SPACING	NOM SIZE	*	**	***	CABLE WIDTH	BASIC SPACING	NOM SIZE	*	**	***	CABLE WIDTH	BASIC SPACING	NOM SIZE	*	**	***
C	2	1	17	18	34	C	3	1	12	13	24	C	4	1	9	10	18
D	2	1 1/2	27	28	54	D	3	1 1/2	18	19	36	D	4	1 1/2	14	15	28
E	2	2	37	38	74	E	3	2	25	26	50	E	4	2	19	20	38
F	2	2 1/2	47	48	94	F	3	2 1/2	32	33	64	F	4	2 1/2	24	25	48
G	2	3	57	58	114	G	3	3	38	39	76	G	4	3	29	30	58

MIL-C-55544/7



THE M55544/7 PLUG PARTS SHOWN ARE REQUIRED FOR THE COMPLETED PLUG ASSEMBLY. THE COMPLETE PART NUMBER IS SHOWN ON TABLE I ON PAGE 2 AND CONSISTS OF (1) EACH OF THE FOLLOWING MOLDED INTEGRALLY WITH THE PLUG BODY:

- | | |
|------------------|-----------------------|
| WINDOW PIECE | - POLYPHENYLENE OXIDE |
| CONDUCTOR SPACER | - POLYPHENYLENE OXIDE |
| INSULATOR | - SILICONE RUBBER |

THE PLUG BODY, MOLDED IN PLACE, IS MADE OF POLYPHENYLENE OXIDE.

THE SEAL, ASSEMBLED AFTER MOLDING, IS MADE OF SILICONE RUBBER AND CEMENTED TO BODY.

THE CABLE IS NOT PART OF THIS SPECIFICATION, BUT IS TO BE CALLED OUT AS REQUIRED ON THE USING DRAWING. THE POTTING MATERIAL WILL ALSO BE CALLED OUT AS REQUIRED ON THE USING DRAWING.

THE CABLE SHALL BE PREPARED AND THE ABOVE LISTED PARTS SHALL BE ASSEMBLED PER DRAWING MS 75079 "METHOD DRAWING - M55544/7 PLUG ASSEMBLY, FLAT CONDUCTOR CABLE."

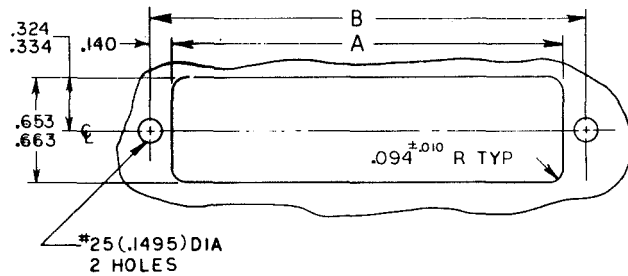
MIL-C-55544/8
26 December 1968



[FSC 5935]

NASA-MSFC RECEPTACLE NUMBER 50M72600 (Page 2 of 2)

MIL-C-55544/8



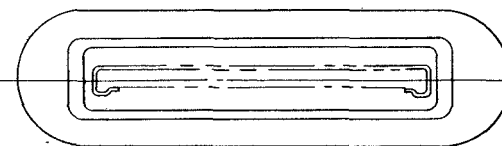
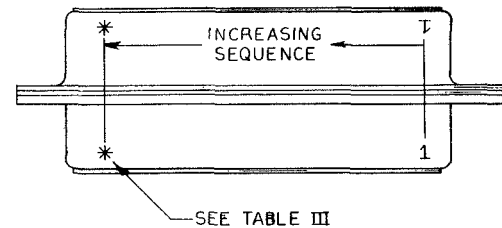
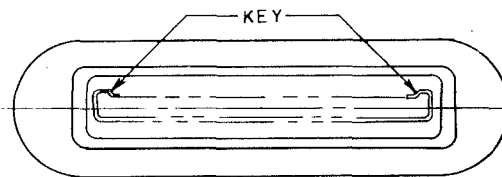
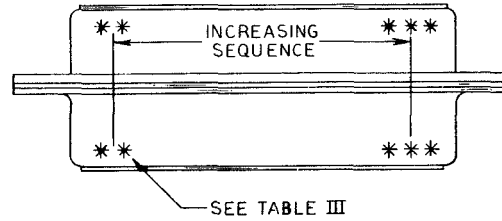
PANEL CUTOUT

TABLE II
PANEL CUTOUT

MILITARY PART NO.		NOM SIZE	DIM A ±.005	DIM B ±.005
M55544/8 F*C		1	1.510	1.790
M55544/8 F*D		1 1/2	1.960	2.240
M55544/8 F*E		2	2.485	2.765
M55544/8 F*F		2 1/2	3.010	3.290
M55544/8 F*G		3	3.460	3.740

TABLE III
CONTACT IDENTIFICATION

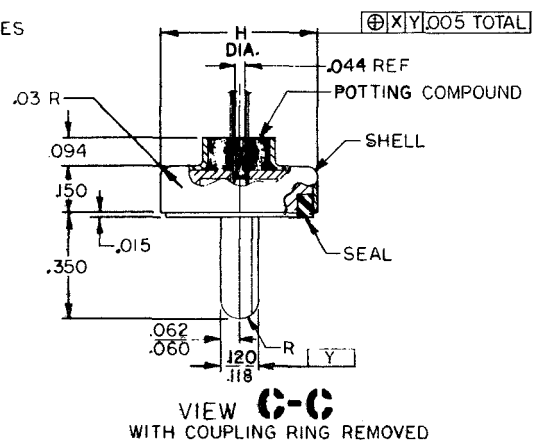
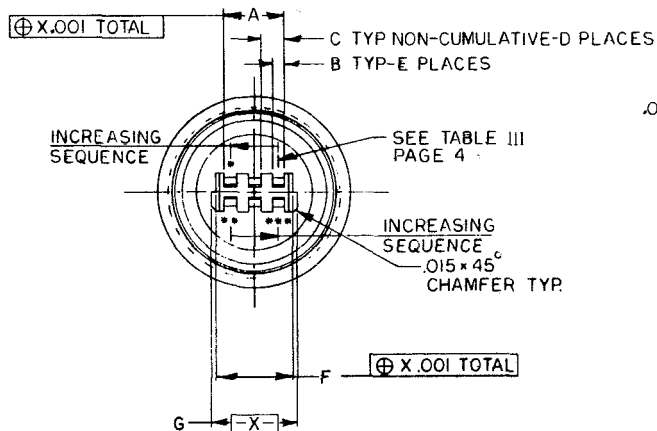
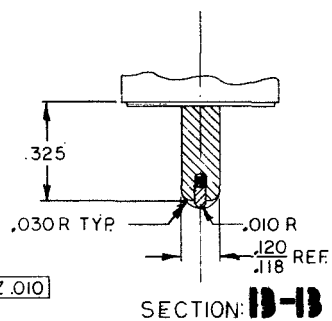
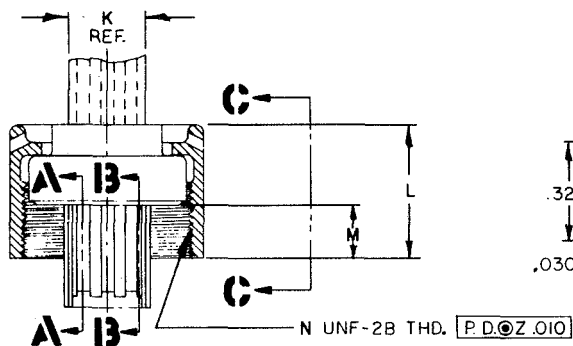
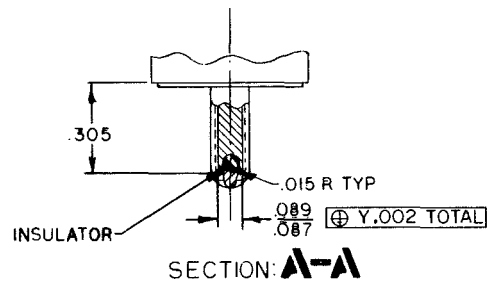
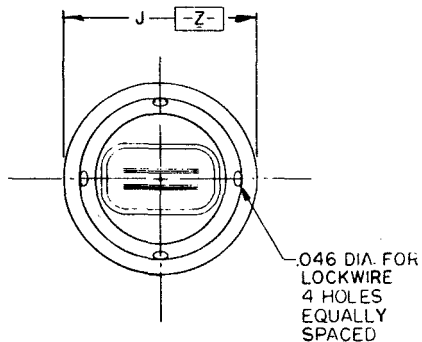
CABLE WIDTH	BASIC SPACING	NOM SIZE	*	*	*	*	*
C	2	1	17	18	34		
D	2	1 1/2	27	28	54		
E	2	2	37	38	74		
F	2	2 1/2	47	48	94		
G	2	3	57	58	114		
C	3	1	12	13	24		
D	3	1 1/2	18	19	36		
E	3	2	25	26	50		
F	3	2 1/2	32	33	64		
G	3	3	38	39	76		
C	4	1	9	10	18		
D	4	1 1/2	14	15	28		
E	4	2	19	20	38		
F	4	2 1/2	24	25	48		
G	4	3	29	30	58		



CONTACT IDENTIFICATION

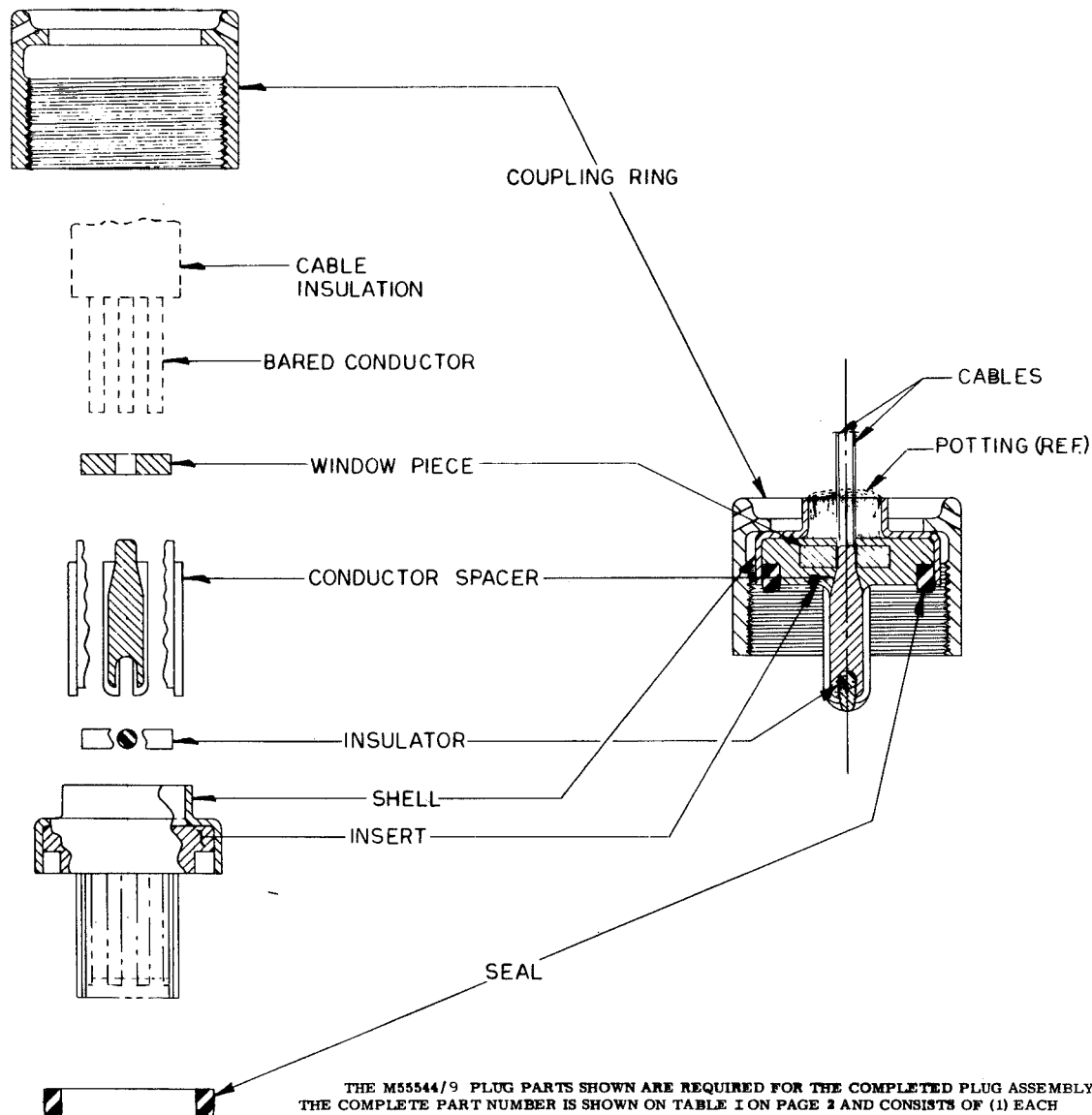
NASA-MSFC PLUGS NUMBERS 50M72606 AND 50M72607 (Page 1 of 2)

MILITARY SPECIFICATIONS SHEET MIL C 55544/9
 CONNECTORS, ELECTRICAL, ENVIRONMENT RESISTANT 26 December 1968
 FOR USE WITH FLEXIBLE FLAT CONDUCTOR CABLE AND ROUND WIRE
 PLUG, CABLE CONDUCTOR, CYLINDRICAL (FLAT CABLE)
 THE COMPLETE REQUIREMENTS FOR PROCURING THE CONNECTOR DESCRIBED HEREIN
 SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN EFFECT OF SPECIFICATION MIL-C-55544



ALL DIMENSIONS $\pm .005$ UNLESS NOTED

[FSC 5935]



THE M55544/9 PLUG PARTS SHOWN ARE REQUIRED FOR THE COMPLETED PLUG ASSEMBLY. THE COMPLETE PART NUMBER IS SHOWN ON TABLE I ON PAGE 2 AND CONSISTS OF (1) EACH OF THE FOLLOWING MOLDED INTEGRALLY WITH THE PLUG BODY.

WINDOW PIECE	-	POLYPHENYLENE OXIDE
CONDUCTOR SPACER	-	POLYPHENYLENE OXIDE
INSULATOR	-	SILICONE RUBBER

THE PLUG BODY, MOLDED IN PLACE, IS MADE OF POLYPHENYLENE OXIDE

THE SEAL, ASSEMBLED AFTER MOLDING, IS MADE OF SILICONE RUBBER AND CEMENTED TO BODY.

THE SHELL, ASSEMBLED AFTER MOLDING, IS MADE OF COPPER AND NICKEL PLATED.

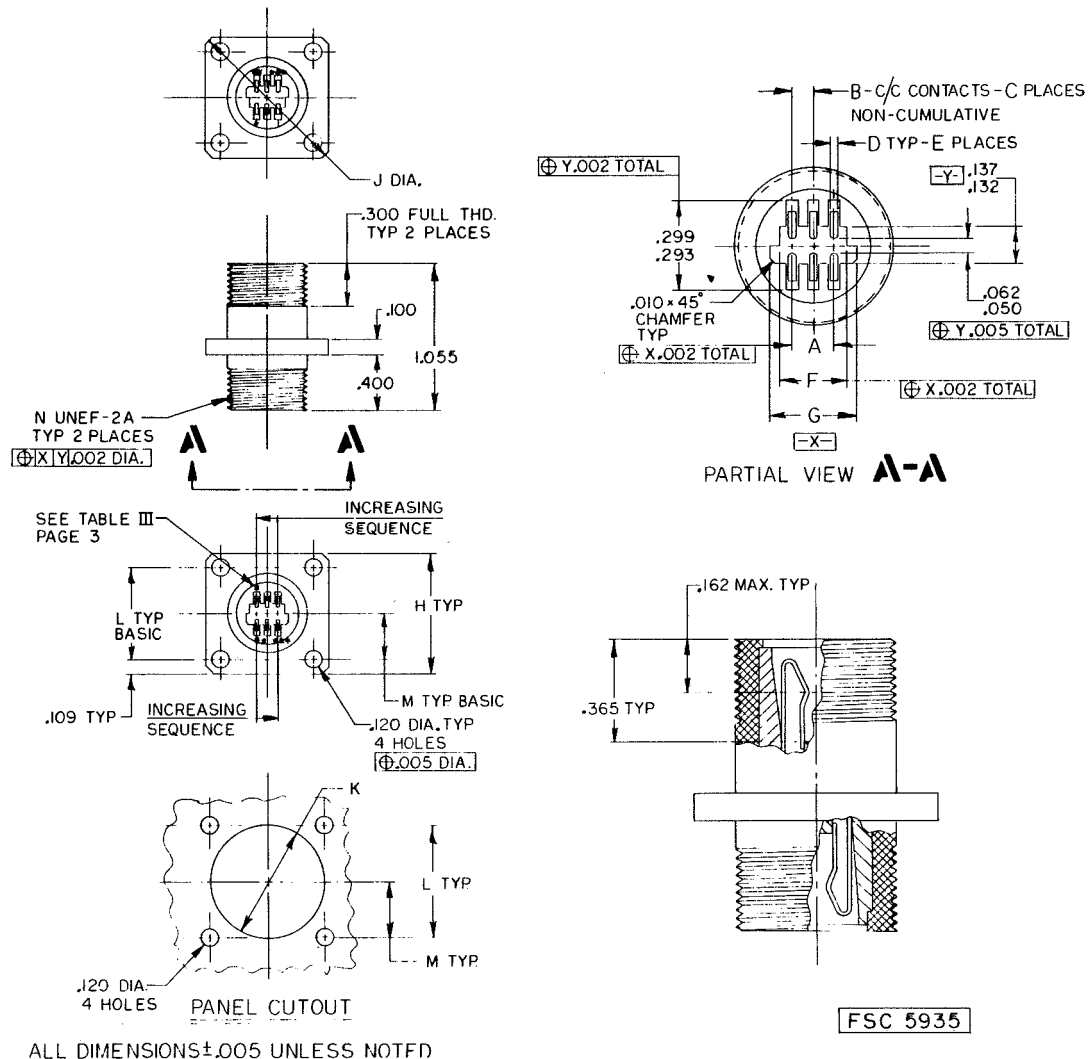
THE CABLE IS NOT PART OF THIS SPECIFICATION, BUT IS TO BE CALLED OUT AS REQUIRED ON USING DRAWING. THE POTTING MATERIAL WILL ALSO BE CALLED OUT AS REQUIRED ON THE USING DRAWING.

THE CABLE SHALL BE PREPARED AND THE ABOVE LISTED PARTS SHALL BE ASSEMBLED PER DRAWING M575080 "METHOD DRAWING - M55544/9 PLUG ASSEMBLY, FLAT CONDUCTOR CABLE."

IV-111

NASA-MSFC RECEPTACLE NUMBER 50M72629 (Page 1 of 1)

MILITARY SPECIFICATION SHEET MIL-C-55544/12
CONNECTORS, ELECTRICAL, ENVIRONMENT RESISTANT 26 December 1968
FOR USE WITH FLEXIBLE FLAT CONDUCTOR CABLE AND ROUND WIRE
RECEPTACLE, CABLE CONDUCTOR, BULKHEAD, CYLINDRICAL, FLANGE MOUNT (FLAT CABLE-FLAT CABLE)
THE COMPLETE REQUIREMENTS FOR PROCURING THE CONNECTOR DESCRIBED HEREIN
SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN EFFECT OF SPECIFICATION MIL-C-55544

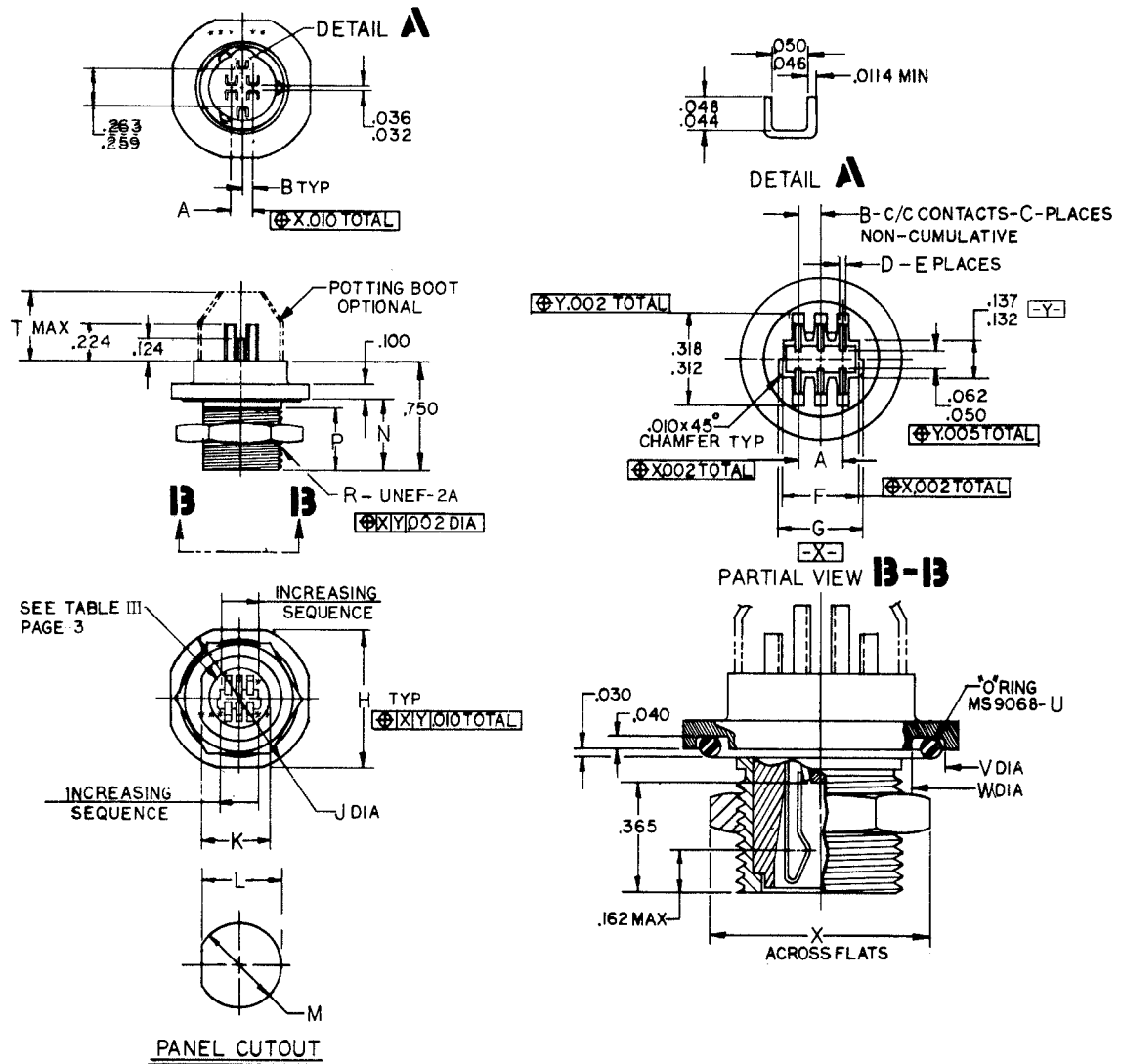


NASA-MSFC RECEPTACLE NUMBER 50M72603 (Page 1 of 1)

MILITARY SPECIFICATION SHEET
 CONNECTORS, ELECTRICAL, ENVIRONMENT RESISTANT
 FOR USE WITH FLEXIBLE FLAT CONDUCTOR CABLE AND ROUND WIRE
 RECEPTACLE, CABLE CONDUCTOR, CYLINDRICAL, JAM NUT MOUNT (FLAT CABLE-WIRE)
 THE COMPLETE REQUIREMENTS FOR PROCURING THE CONNECTOR DESCRIBED HEREIN
 SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN EFFECT OF SPECIFICATION MIL-C-55544

MIL-C-55544/14

26 December 1968

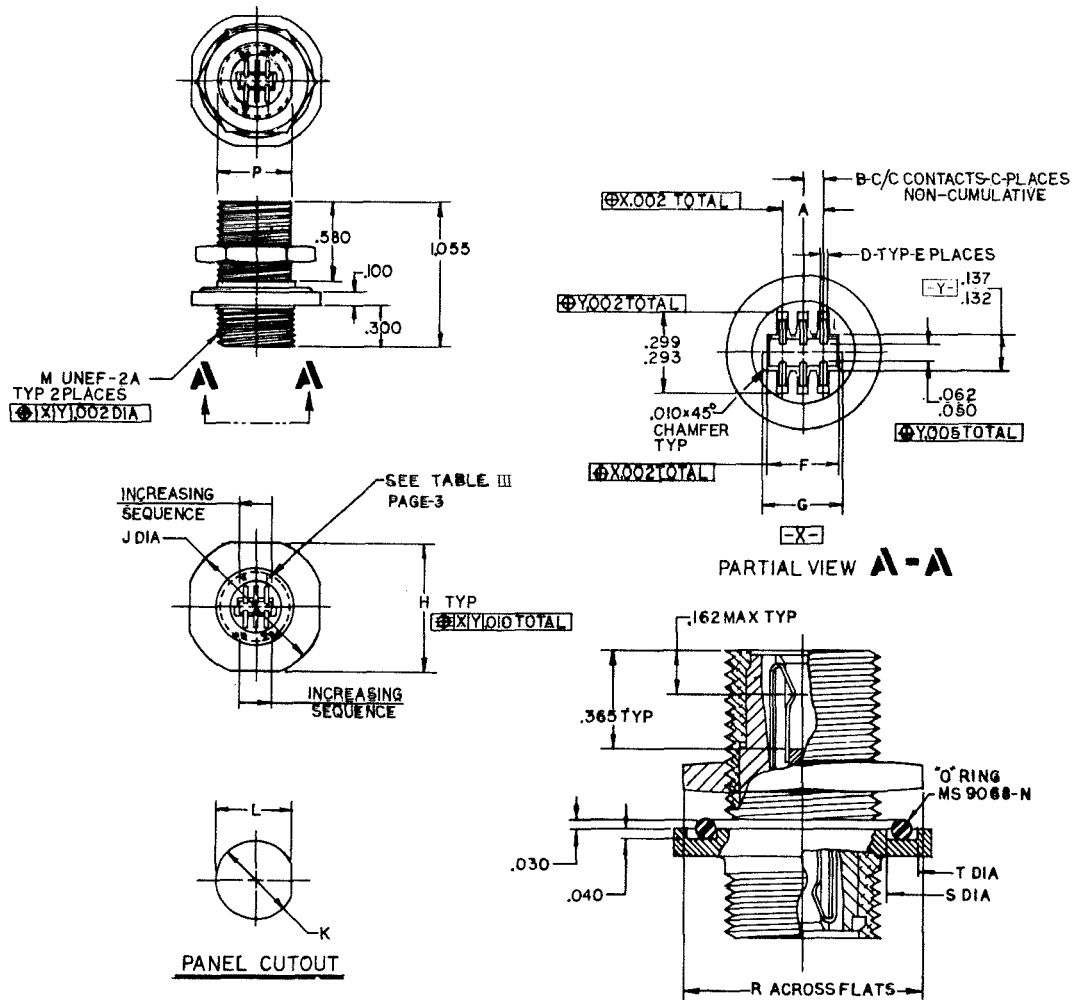


ALL DIMENSIONS $\pm .005$ UNLESS NOTED

[FSC 5935]

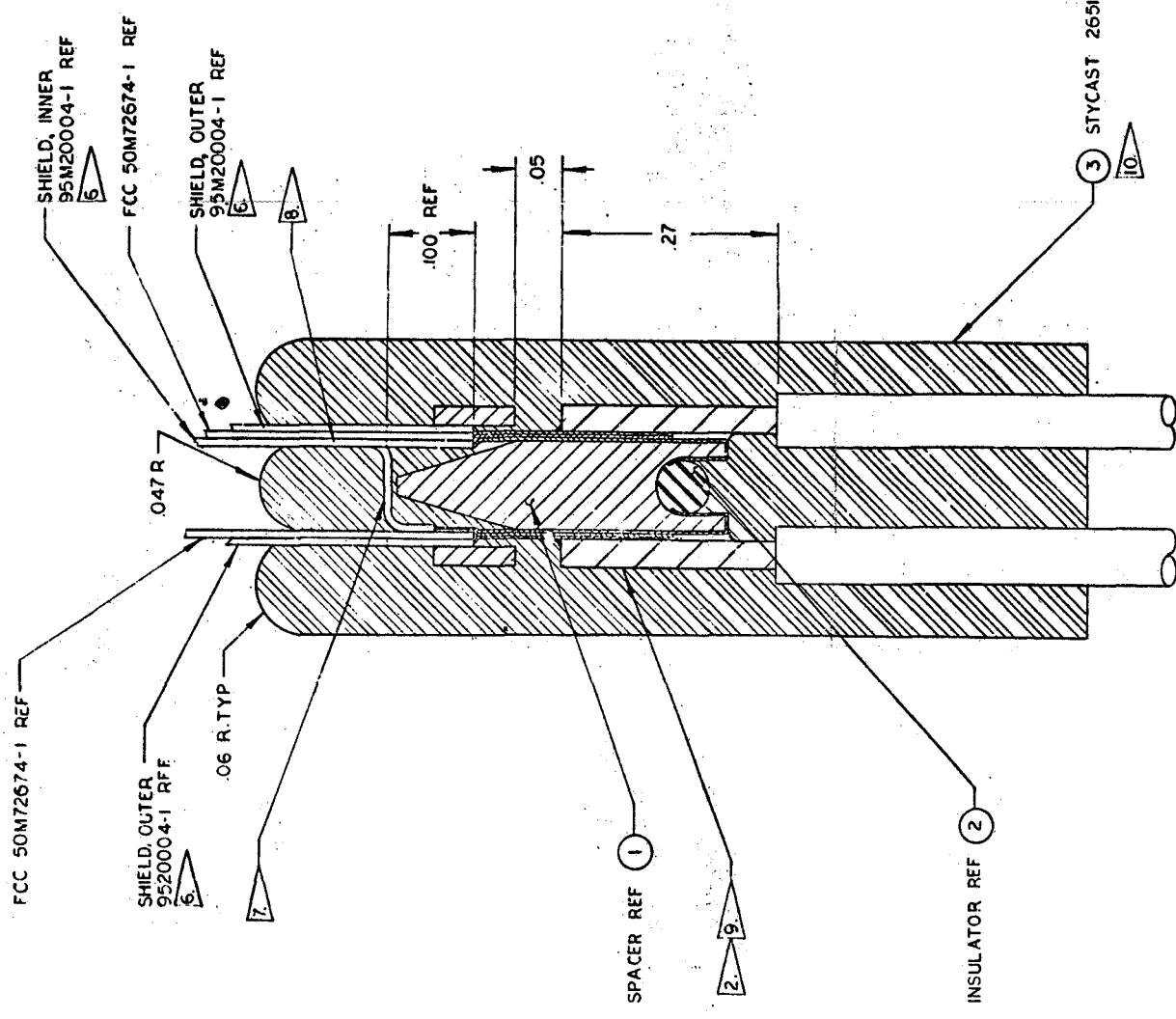
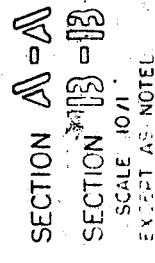
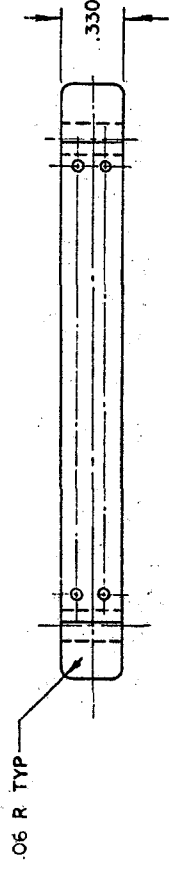
NASA-MSFC RECEPTACLE NUMBER 50M72630 (Page 1 of 1)

MILITARY SPECIFICATION SHEET
 CONNECTORS, ELECTRICAL, ENVIRONMENT RESISTANT
 FOR USE WITH FLEXIBLE FLAT CONDUCTOR CABLE AND ROUND WIRE
 RECEPTACLE, CABLE CONDUCTOR, BULKHEAD, CYLINDRICAL, JAM NUT MOUNT (FLAT CABLE-FLAT CABLE)
 THE COMPLETE REQUIREMENTS FOR PROCURING THE CONNECTOR DESCRIBED HEREIN
 SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN EFFECT OF SPECIFICATION MIL-C-55544



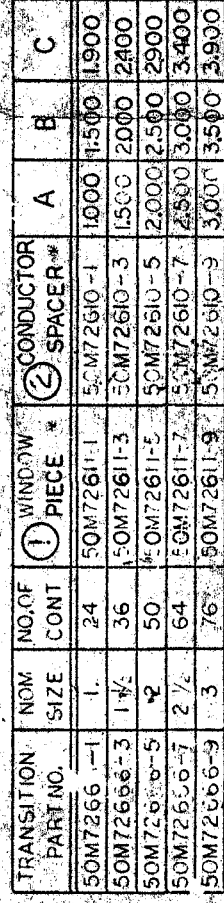
ALL DIMENSIONS $\pm .005$ UNLESS NOTED


FSC 5935



SCALE 2/1

SEE ENGINEERING RECORDS	UNLESS OTHERWISE SPECIFIED	ORIGINAL DATE OF DRAWING				TRANSITION ASSEMBLY SHIELDED SIGNAL FCC TO 20 AWG ATM	GEORGE C. MARSHALL SPACE FLIGHT CENTER NATIONAL AERONAUTICS AND SPACE ADMINISTRATION HUNTSVILLE, ALABAMA	SHEET NO. 2 OF 2
		DIMENSIONS ARE IN INCHES	DECIMALS	ANGLES	CHECKED DESIGNED SUBMITTED APPROVED			
NEET ASST	FINAL PROTECTIVE FINISH	MATERIAL				WEIGHT CHECKED	DATE	CODE 14951
USED ON		HEAT TREATMENT				SCALE	UNIT WEIGHT	
APPLICATION								

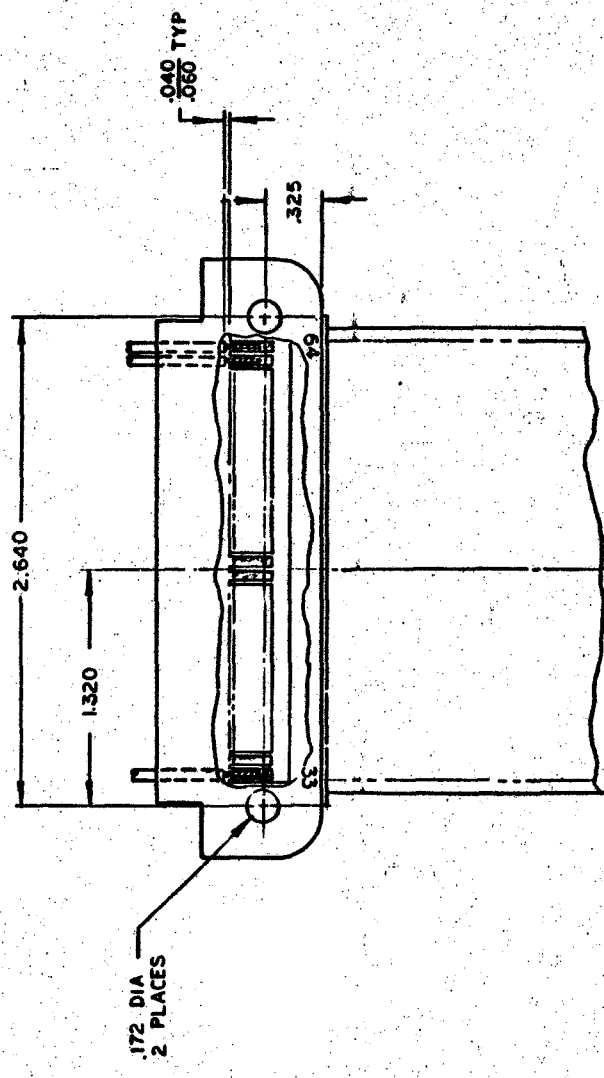
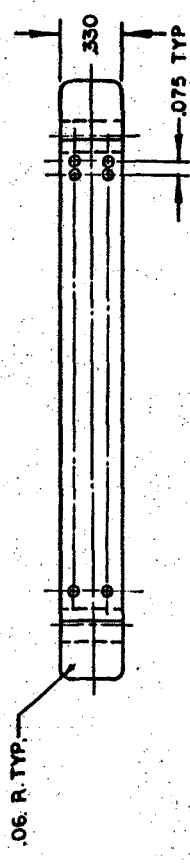
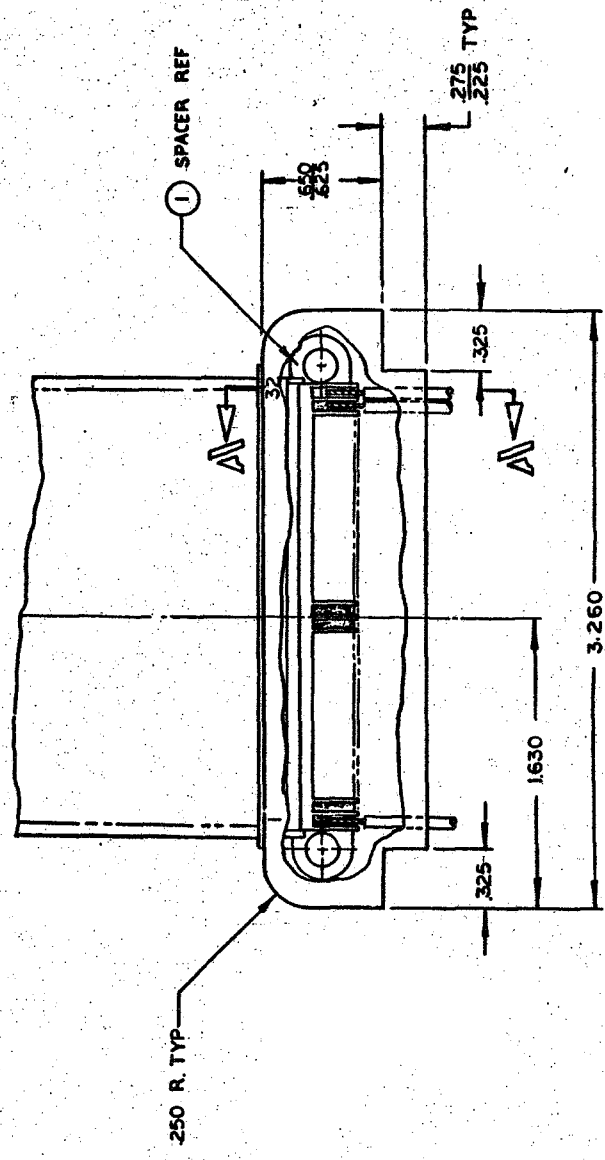


1. *MATERIAL FIBERITE EPOXY E2748.
2. TEMPERATURE RANGE - 65C TO +150 MAX OR AS LIMITED BY FLAT CABLE AND/OR WIRE.
3. VOLTAGE 1 - 300 rms.
4.  USE SN-60 SOLDER PER QQ-S-571D.
APPLY ACCORDING TO NPC-200-

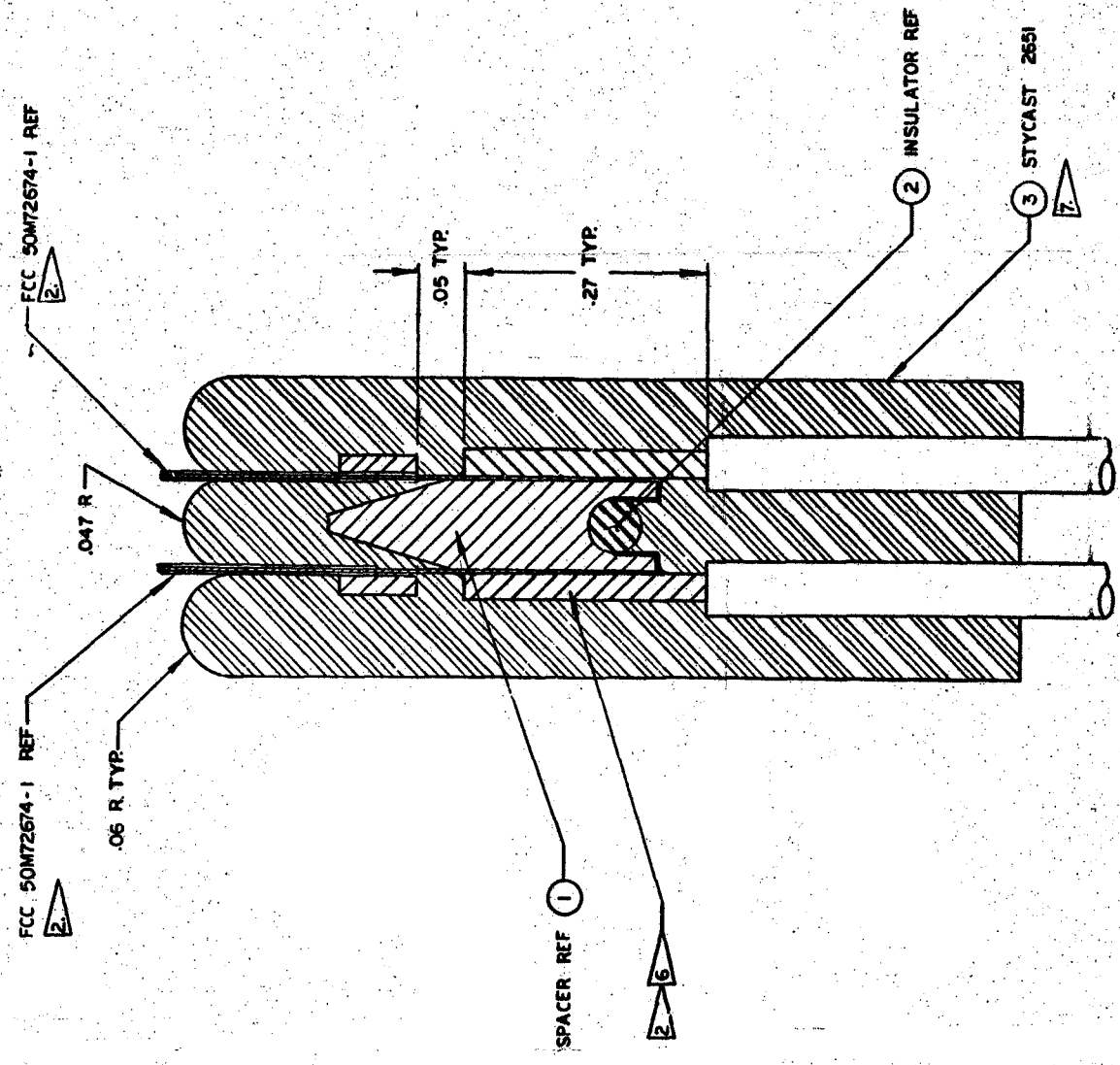
VVNC	GME	GPVI
------	-----	------

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
FRACTIONS
DECIMALS
ANGLES
TOLERANCES
SURFACE FINISH
MATERIAL
HEAT TREATMENT
TYPICAL
FINAL INSPECTIVE FROM

PART NO.		REVISIONS		DATE	
REV	DESCRIPTION	DATE	BY	DATE	BY
1					
2					
3					



VIEW C
ROTATED 90° CW
SCALE 2/1



SECTION A-A
SCALE 10/1

50M72676

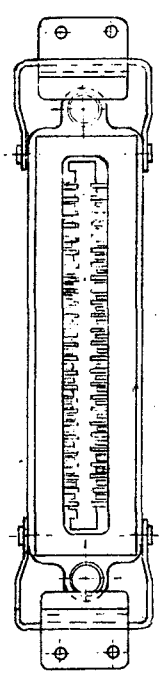
UNLESS OTHERWISE SPECIFIED		ORIGINAL DATE		TRANSITION ASSEMBLY		GEORGE C. MARSHALL	
DIMENSIONS AND TOLERANCES		OF DRAWING		UNSHIELDED		SPACE FLIGHT CENTER	
FRACTIONS		DECIMALS		SIGNAL FCC 10-26-AWG		NATIONAL AERONAUTICS	
ANGLES		TYPICAL		705 UNIT		AND SPACE ADMINISTRATION	
TOLERANCES		APPROVED		DATE		MONTGOMERY, ALABAMA	
MATERIAL		HEAT TREATMENT		14981			
FINAL INSPECTIVE FROM		APPLICATION		SCALE		D 50M72676	
MATERIAL		HEAT TREATMENT		14981			
FINAL INSPECTIVE FROM		APPLICATION		SCALE		D 50M72676	

NOTES: 1. EYELET NO. SE 511 UNITED SHOE MACHINERY CORP., FASTENER DIVISION SHELTON CONN. 2. BOND FIND NO. 4 TO FIND NO. 1 & 2 WITH STYCAST 2651 BY EMERSON CUMING MSFC-SPEC 2.22 TYP III

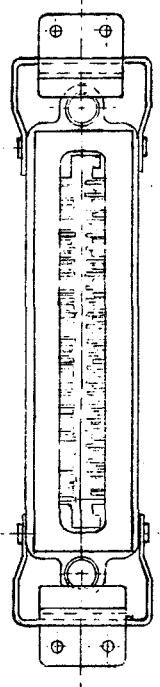
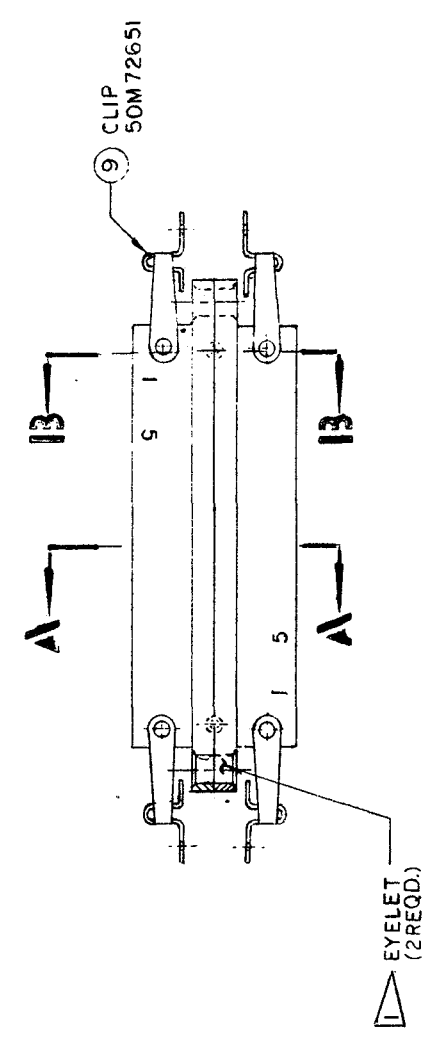
PART NO.		REVISIONS	
ZONE	SYM	DESCRIPTION	DATE

WASHER GRES. ⑥
QD.125XID.067X.025
ASA B272
NARROW SERIES

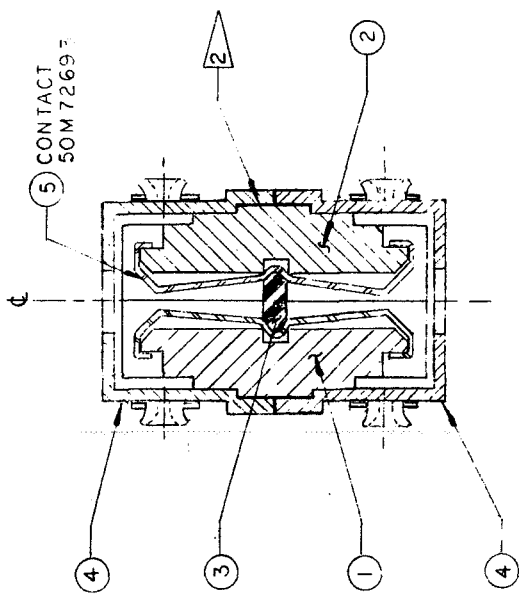
SCREW R.D.H.D.CRES ⑦
O-80 X DIM. A LONG
REF M S 35357



PARTIAL SECTION 13-13
SCALE 4/1
TYP-2 PLACES



SECTION A-A
SCALE 4/1



95M20000

RECEPTACLE ASSY. NO.	NOM. SIZE	COND.	① RECEPT. HALF	② RECEPT. HALF (KEYED)	③ DUST SEAL	④ SHELL (2 REQ'D)	DIM. A
95M20000-1	1	24	95M20001-1	95M20002-1	50M72696-1	95M20003-1	.500
95M20000-3	1 1/2	36	95M20001-3	95M20002-3	50M72696-3	95M20003-3	.500
95M20000-5	2	50	95M20001-5	95M20002-5	50M72696-5	95M20003-5	.500
95M20000-7	2 1/2	64	95M20001-7	95M20002-7	50M72696-7	95M20003-7	.580
95M20000-9	3	76	95M20001-9	95M20002-9	50M72696-9	95M20003-9	.580

SEE ENGINEERING RECORDS		UNLESS OTHERWISE SPECIFIED		ORIGINAL DATE		DRAWING NO. 123/1969	
DIMENSIONS ARE IN INCHES		TO FRACTIONS		CHECKER		DESIGNER	
DECIMALS		ANGLES		SUBMITTED		APPROVED	
MATERIAL		HEAT TREATMENT		DIRECTOR		DATE	
FINAL PROTECTIVE FINISH		USED ON		WEIGHT CHECKER		DATE	
APPLICATION		SCALE		2 / 1		UNIT WEIGHT	

THOMAS & BETTS



APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
SEE ENGINEERING RECORDS	MR	A	SEE E.O.	6 NOV 69	6 NOV 69 N. J. Martin
11246984		B	SEE E.O.	11 FEB 70	DVM

INTERPRET DRAWING IN
ACCORDANCE WITH MIL-D-1000,
FORM 1 CATEGORY F

REV																			
SH																			
ALL SHEETS ARE <u>B</u>		REV						A		A									
REV UNLESS SHOWN		SH	1	2	3	4	5	6	7										

SOURCE CONTROL DRAWING		DOUGLAS AIRCRAFT CO. INC SANTA MONICA, CALIF. 90406		PARTS LIST PL _____ ARMY PART NO. 11269569	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		BELL TELEPHONE LABORATORIES, INCORPORATED WHIPPANY, NEW JERSEY 07981		U. S. ARMY MATERIEL COMMAND REDSTONE ARSENAL, ALABAMA	
TOLERANCES ON		CONTRACT NO. <u>DA-30-069-AMC-2227</u>		SPlice, CONDUCTOR UNINSULATED	
2 PLACE DEC \pm —		ORIGINAL DATE OF DRAWING <u>1 AUG '69</u>			
3 PLACE DEC \pm —		ORIG: <u>R.H. MARTIN</u>			
FRACTIONS \pm —		CHK: <u>E. J. Martin</u> 4 SEP 69			
ANGLES \pm —		APPROVED _____		SIZE CODE IDENT NO.	
MATERIAL _____		BY ORDER OF CG, AMC		A 17773	
		APPROVED <u>T. H. Luck</u>		11269569	
				SCALE NONE	
				SHEET 1 OF 7	

1. SCOPE

THIS SPECIFICATION DEFINES A POWDERED METAL CRIMP SPLICE TO BE USED AS A TRANSITION FROM AWG 20 STRANDED WIRE TO FLAT COPPER CONDUCTOR .006 X .065.

2. APPLICABLE DOCUMENTS

2.1 THE FOLLOWING DOCUMENTS (AND SUBSIDIARIES THEREOF), OF THE ISSUE IN EFFECT ON DATE OF INVITATION FOR BID OR REQUEST FOR PROPOSAL, EXCEPT AS OTHERWISE NOTED OR CONTROLLED ON AN INDIVIDUAL BASIS, FORM A PART OF THIS DRAWING TO THE EXTENT SPECIFIED HEREIN

SPECIFICATIONS

MILITARY

MIL-T-7928	TERMINALS, LUG AND SPLICE, CRIMP-STYLE, COPPER
MIL-W-81044/12	WIRE, ELECTRIC, CORSSLINKED POLYALKENE, INSULATED, TIN-COATED COPPER, LIGHT WEIGHT, 150°C.
MIL-C-55543/3	CABLE, ELECTRICAL, FLAT, FLEXIBLE, POLYIMIDE/FLUORINATED ETHYLENE PROPYLENE INSULATED, NICKEL COATED STRIP-COPPER CONDUCTOR, 300 VOLT, 200°C.
MIL-T-10727	TIN PLATING: ELECTRODEPOSITED OR HOT-DIPPED, FOR FERROUS AND NON-FERROUS METALS.

STANDARDS

MILITARY

MIL-STD-105	SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY ATTRIBUTES
MIL-STD-130	IDENTIFICATION MARKING OF U.S. MILITARY PROPERTY

AMERICAN SOCIETY FOR TESTING MATERIALS

E-384-69	STANDARD METHOD OF TEST FOR MICRO-HARDNESS OF MATERIALS
----------	---

3. REQUIREMENTS

3.1 THE SPLICES FURNISHED UNDER THIS SPECIFICATION SHALL BE A PRODUCT WHICH HAS BEEN TESTED AND PASSED THE DESIGN EVALUATION TESTS SPECIFIED HEREIN.

3.2 MATERIALS

THE SPLICES SHALL BE FABRICATED OF, OXYGEN FREE, HIGH CONDUCTIVITY COPPER POWDER.

THE SINTERED DENSITY SHALL BE 7.6 GRAMS PER CUBIC CENTIMETER.

SIZE A	CODE IDENT NO. 17773	11269569	
SCALE —		LTR B	SHEET Z

3.2.1 HARDNESS

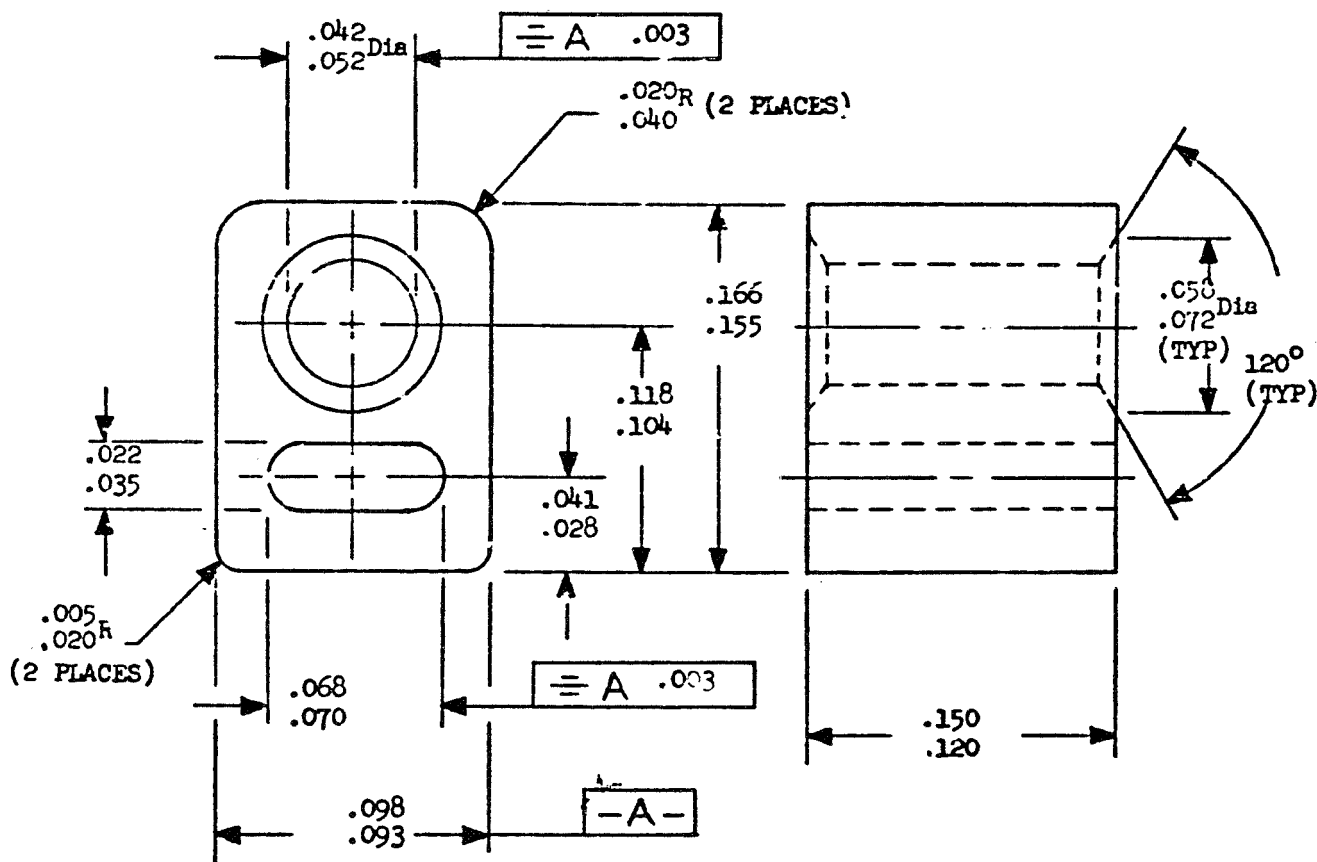
THE PARTS, AFTER SINTERING, SHALL BE MICRO HARDNESS TESTED USING A 500 GRAM KNOOF TEST PROCEDURE PER ASTM E384-69. THE ACCEPTABLE RANGE SHALL BE: 40 - 70, A MINIMUM OF THREE (3) TESTS ARE TO BE MADE ON EACH PART. ANY VALUE RECEIVED FROM AN IMPRESSION THAT FALLS IN AN AREA WHERE A VOID AFFECTS THE READING IS TO BE DISCOUNTED.

3.3 FINISH

PARTS SHALL BE TINNED OVER THEIR ENTIRE AREA WITH TYPE II OF MIL-T-10727.

3.4 DESIGN AND CONSTRUCTION

THE SPLICE SHALL BE CONSTRUCTED AS FOLLOWS:



SIZE A	CODE IDENT NO. 17773	11269569
SCALE NONE	LTR E	SHEET 3

3.5 PERFORMANCE

THE SPLICES SHALL BE CAPABLE OF MEETING THE FOLLOWING REQUIREMENTS WHEN CRIMPED TO A NICKEL-PLATED FLAT COPPER CONDUCTOR. .006 X .065 CONFORMING TO MIL-C-55543/3, AND A STRANDED, TIN COATED COPPER CONDUCTOR, AWG 20 CONFORMING TO MIL-W-81044/12.

3.5.1 VOLTAGE DROP

THE VOLTAGE DROP THROUGH THE SPLICE, WHEN CARRYING 4.5 AMPS, SHALL NOT EXCEED 7 MILLIVOLTS BEFORE CURRENT CYCLING, AND 11 MILLIVOLTS AFTER CURRENT CYCLING.

3.5.2 CURRENT CYCLING

PARTS SHALL WITHSTAND 100 CYCLES AT 5.6 AMPS WITHOUT EXCEEDING VALUES NOTED IN 3.5.1.

3.5.3 TENSILE STRENGTH

THE MECHANICAL CONNECTION OF THE WIRES AND THE SPLICE SHALL NOT BREAK OR BECOME DISTORTED BEFORE 12 POUNDS TENSILE PULL IS REACHED.

2.6 IDENTIFICATION

DIRECT PART IDENTIFICATION NOT REQUIRED. IDENTIFY ON CONTAINER OR PACKAGE IN ACCORDANCE WITH MIL-STD-130. IDENTIFY WITH PART NUMBER 11269569.

4. QUALITY ASSURANCE PROVISIONS

4.1 INSPECTION RESPONSIBILITY

INSPECTION RECORDS OF THE EXAMINATION AND TESTS SHALL BE KEPT COMPLETE AND AVAILABLE TO THE PROCURING ACTIVITY AS SPECIFIED IN THE CONTRACT OR ORDER.

THE PROCURING ACTIVITY RESERVES THE RIGHT TO PERFORM ANY OF THE INSPECTIONS SET FORTH IN THE SPECIFICATION WHERE SUCH INSPECTIONS ARE DEEMED NECESSARY TO ASSURE SUPPLIES AND SERVICES CONFORM TO PRESCRIBED REQUIREMENTS.

4.2 CLASSIFICATION OF INSPECTIONS

DESIGN EVALUATION TEST (4.3)

ACCEPTANCE INSPECTION (4.4)

SIZE A	CODE IDENT NO. 17773	11269569	
SCALE —		LTR B	SHEET 4

4.3 DESIGN EVALUATION TEST

THESE TESTS DETERMINE IF THE DESIGN COMPLIES WITH DESIGN REQUIREMENTS FOR THE ITEM.

THE DESIGN EVALUATION TEST SAMPLES SHALL CONSIST OF 100 PIECES.
THE SAMPLES SHALL BE REPRESENTATIVE OF THE MANUFACTURER'S NORMAL PRODUCTION.
DESIGN EVALUATION TEST SHALL CONSIST OF THE FOLLOWING:

1. VISUAL AND DIMENSIONAL
2. HARDNESS
3. VOLTAGE DROP
4. CURRENT CYCLE
5. TENSILE TEST

4.4 PRODUCT ACCEPTANCE INSPECTION

THESE TESTS DETERMINE IF PRODUCTION TECHNIQUES ADVERSELY AFFECT CONFORMANCE TO DESIGN.

ACCEPTANCE INSPECTIONS ARE THOSE INSPECTIONS PERFORMED ON INDIVIDUAL LOTS WHICH HAVE BEEN SUBMITTED FOR ACCEPTANCE. ACCEPTANCE INSPECTIONS SHALL CONSIST OF THE FOLLOWING:

1. VISUAL AND DIMENSIONAL
2. HARDNESS
3. VOLTAGE DROP (WITHOUT CURRENT CYCLE)
4. TENSILE

4.4.1 SAMPLING PROCEDURE

A RANDOM SAMPLE SHALL BE SELECTED FROM EACH INSPECTION LOT IN ACCORDANCE WITH MIL-STD-105, GENERAL INSPECTION LEVEL II. THE ACCEPTABLE QUALITY LEVEL (AQL) SHALL BE 1.0 PERCENT FOR MAJOR DEFECTS AND 4.0 PERCENT FOR MINOR DEFECTS.

MAJOR DEFECTS SHALL BE THOSE WHICH INTERFERE WITH THE INSTALLATION AND THE ELECTRICAL FUNCTION OF THE SPLICES. MINOR DEFECTS SHALL BE THOSE THAT ARE OBJECTIONABLE BUT DO NOT RENDER THE SPlice AS USELESS.

SEVERAL EXAMPLES ARE AS FOLLOWS:

MAJOR DEFECTS

1. ANY DIMENSIONAL DISCREPANCY OUTSIDE SPECIFIC LIMITS.
2. FAILURE TO MEET HARDNESS REQUIREMENT.
3. FAILURE TO MEET PERFORMANCE REQUIREMENTS.

MINOR DEFECTS

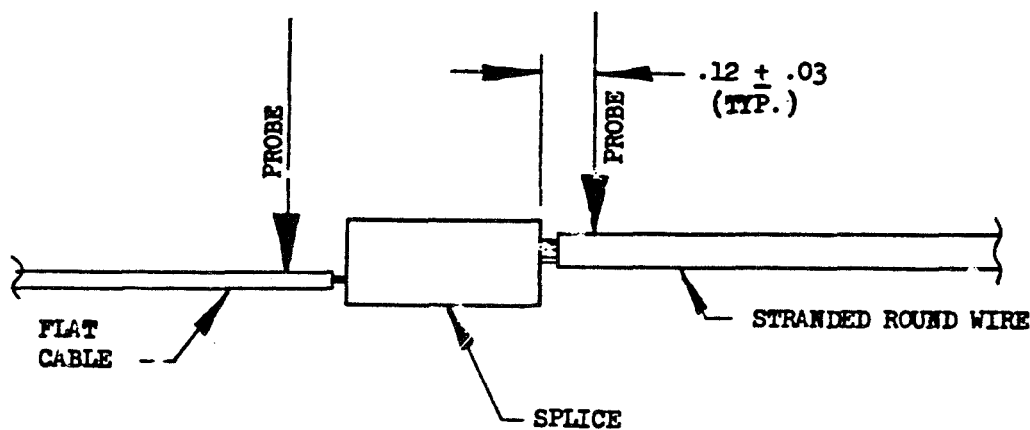
1. EXPOSED COPPER AREAS.
2. SURFACE BLEMISHES OR IRREGULARITIES.

SIZE A	CODE IDENT NO. 17773	11269569	
SCALE —		LTR A	SHEET 5

4.5 TEST CONDITIONS

4.5.1 VOLTAGE DROP

VOLTAGE DROP MEASUREMENTS SHALL BE MADE BEFORE AND AFTER CURRENT CYCLING. MEASUREMENTS SHALL BE MADE BY PUNCTURING THE INSULATION OF THE CURRENT-CARRYING CONDUCTOR ON EACH END OF THE SPLICE. LOCATION OF THE TWO TEST PROBES SHALL BE AS NOTED BELOW. MEASUREMENTS ARE TO BE MADE AFTER TEMPERATURE STABILIZATION.



4.5.2 CURRENT CYCLING

TEST SAMPLES ATTACHED TO THREE FOOT LENGTHS OF APPROPRIATE WIRE SHALL BE SUBJECTED TO 100 CYCLES. EACH CYCLE SHALL CONSIST OF 30 MINUTES AT 5.6 AMPS FOLLOWED BY 15 MINUTES AT NO LOAD.

4.5.3 TENSILE STRENGTH

TENSILE TESTING SHALL BE PERFORMED IN ACCORDANCE WITH MIL-T-7928. BREAKING STRENGTH SHALL NOT BE LESS THAN VALUE NOTED IN 3.5.3.

5. PREPARATION FOR DELIVERY

5.1 PRESERVATION AND PACKAGING

THE SPLICES SHALL BE PACKAGED IN A MANNER THAT WILL INSURE A SAFE, UNDAMAGED, DELIVERY TO POINT OF DESTINATION.

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SCALE —		LTR B	SHEET 6

6. NOTES

6.1 SOURCE OF SUPPLY

THE THOMAS AND BETTS CO.
ELIZABETH, N. J. 07207

FEDERAL CODE: 59730

MANUFACTURER'S PART NUMBER: 675-53375-2

6.2 INSPECTION LOT

AN INSPECTION LOT IS A COLLECTION OF UNITS OF PRODUCT FROM WHICH A SAMPLE IS DRAWN AND INSPECTED TO DETERMINE COMPLIANCE WITH THE ACCEPTABILITY CRITERIA. EACH LOT SHALL CONSIST OF UNITS MANUFACTURED UNDER THE SAME CONDITIONS AND WITH THE SAME MATERIALS.

6.3 ONLY THE ITEM LISTED ON THIS DRAWING AND IDENTIFIED BY VENDOR'S NAME, ADDRESS, AND PART NUMBER OR IDENTIFIER HAS BEEN TESTED AND APPROVED BY SAFEGUARD SYSTEM COMMAND FOR USE IN MISSILE SYSTEMS.

A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR TESTING AND APPROVAL BY SAFEGUARD SYSTEM COMMAND.

SIZE A	CODE IDENT NO. 17773	11269569	
SCALE —		LTR A	SHEET 7

ENGINEERING ORDER DOUGLAS AIRCRAFT CO., INC.		FIRM		A		CODE 18355		235920 236689		1 2		A 11269569	
FORM 25-509 (REV. 1-57) ©		SANTA MONICA, CALIF.		OUTSTANDING AEO & SEC		DATE 26 FEB 1971		SHEET OF		DRAWING CHANGED		B	
TITLE: SPLICE, CONDUCTOR-UNINSULATED		EXTRA E.O.		ENGRG TIME CHRG.		EWD		WRO		IPWO		DATE	
DISPOSITIONS:		1. FABRICATION EFFECTIVITY MUST CONFORM. ASSY/INSTAL USAGE OF CHANGED OR PRIOR PARTS ACCEPTABLE		3960 -1221		12690		115-15.2 .5-01		DATE		DATE	
2. PARTS MUST CONFORM AT NOTED EFFECTIVITY		CUSTOMER		CUSTOMER AUTH		DESIGN SECTION		AEO		DATE		DATE	
3. REWORK AS NOTED		STRENGTH		NA		RELEASE & MATERIAL		EFFECTIVITY		DATE		DATE	
5. NOTED		WEIGHT		NA		CHARGE CONTROL		EFFECTIVITY		DATE		DATE	
E.O. MADE BY		R.H. MARTIN		204870		2-20-70		EFFECTIVITY		DATE		DATE	
R.H. MARTIN		PRO ENGR		204870		2-20-70		EFFECTIVITY		DATE		DATE	
MODEL		SECTION		EFFECTIVITY		EFFECTIVITY		EFFECTIVITY		DATE		DATE	
115		INSTR		A2		800025		800045		800025		800045	
115		INSTR		A2		900201		900201		900201		900201	
115005A		1550		A		800026		800046		800046		800046	
115005A		1550		A2		800026		800046		800046		800046	
320001A		1000		AB		000001		000009		000009		000009	

TABULATION	FINAL ASBY REQTS	NEW	FORMER	NEXT ASSEMBLY	DRAWING NUMBER	EFP	SYM
11269569	0	60	11246984	A			

AFFECTS SHEET 2 (PARA 2)
ADDED:
AMERICAN SOCIETY FOR TESTING MATERIALS

E-384-69 STANDARD METHOD OF TEST FOR MICRO-HARDNESS
OF MATERIALS.

AFFECTS SHEET 3
(PARA 3.2.1)
ADDED: REQUIREMENT FOR HARDNESS.

NOTE: SEE LINE #3 DELETED-RELD IN ERROR. N/A 11296484 IS A DIAGRAM
IT DOES HAVE A REQUIREMENT FOR 11269569.

11269569
DWG NO.

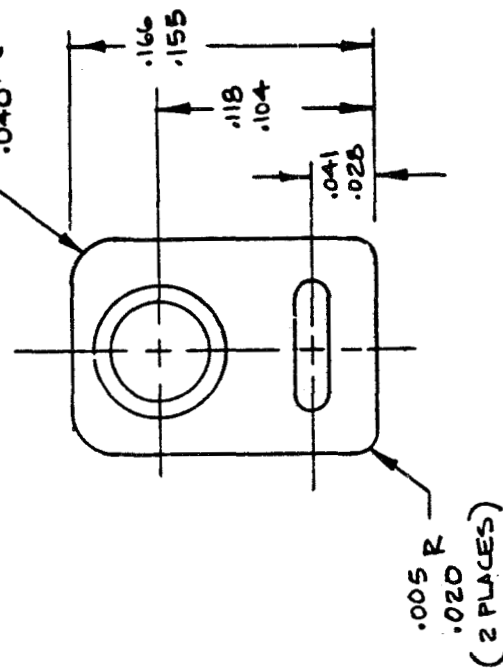
SHEET 2 OF 2	A	11269569
DATE 26 FEB 1970	1	DRAWING CHANGED
DATE	2	ADVANCE E.O.
DATE	3	SERIAL E.O.
DATE	4	NEW/REVISED RELEASE

AFFECTS SHEET 3, SPLICE DETAIL
REVISED & ADDED DIMENSIONS AS FOLLOWS:

15

.020 R (2 PLACES)

WAS



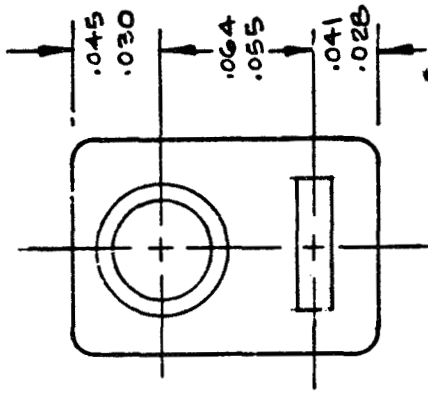
AFFECTS SHEET 4

REVISED PARA. 3.5.1 VOLTAGE DROP

AFFECTS SHEET 6

REVISED PARA. 4.5.1 VOLTAGE DROP

REASON: TO ADD HARDNESS REQMT, PREVIOUSLY OMITTED. TO PROPERLY
DIMENSION PART & TO DOCUMENT FINALIZED DIMENSIONAL
LIMITS AS COORDINATED WITH MANUFACTURER.
REVISED VOLTAGE DROP REQMT'S TO VALUES WITH ACCEPTABLE
LIMITS.



SPARTAN CCCB
DATE FEB 20 1970
LOG NO. 13606
CLASS II
ACTION SIGN
APPROVE <i>WJD</i>
DISAPPROVE

11269569
DWS NO.



APPROVAL

NASA TMX-64613

FLAT CONDUCTOR CABLE CONNECTOR SURVEY OF 1970

By W. Angele, Hans G. Martineck, J D Bennight and James D. Hankins

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This document has also been reviewed and approved for technical accuracy.



M. P. L. SIEBEL

Director, Product Engineering and Process
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